

The American Journal of Orthopedic Surgery

I.

AN ANATOMIC AND MECHANICAL STUDY OF THE SHOULDER-JOINT, EXPLAINING MANY OF THE CASES OF PAINFUL SHOULDER, MANY OF THE RECURRENT DISLOCATIONS, AND MANY OF THE CASES OF BRACHIAL NEURALGIAS OR NEURITIS.*

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The studies that represent the basis of this paper were undertaken in the hope that they might lead to a better understanding of certain groups of "shoulder cases" which to the writer had not been previously understood, so that they naturally yielded unsatisfactorily to treatment, and which were not satisfactorily described in any of the literature with which the writer was familiar.

Much of the work has been carried on in the Anatomical Department of the Harvard Medical School, and I am indebted to Professor Dwight and Professor Warren for the use of anatomical material and for many valuable suggestions.

The cases studied all had symptoms referred to the shoulder or arm, and while regionally similar, clinically many of them were unlike, but most of them could be arranged in three groups.

Of these, the first and by far the largest group was characterized by complaint of pain commonly referred to the anterior part of the shoulder-joint, with limitation of certain motions, chiefly rotation, without corresponding limitation in the other directions.

*Read before the American Orthopedic Association in Chicago, June, 1908.

The pain, while commonly referred to the anterior part of the shoulder, was frequently referred to the general region of the deltoid muscle, being most often designated as rheumatism, periarthrititis, or neuritis, and was always aggravated by use, with proportionate relief from rest in certain positions, although aggravated by rest in other positions. The limitation of motion was felt most when the arm was abducted at the same time it was rotated, such as would be the case in putting on a coat, in doing one's hair, fastening waistbands at the back, etc.

As the supposed cause of this condition definite trauma was often mentioned. At other times no such history was obtainable, and the onset being more gradual, a rheumatic lesion of some form has been accepted as the cause.

The course of this type of disease has usually not been strikingly modified by any form of treatment, although with rest, the application of local heat, the cautery, massage, and with various drugs, recovery usually occurred after considerable periods, but frequently leaving some impairment of motion in the arm at the shoulder as a permanent disability. The time required for recovery has varied with the severity of the disease, and while in the mild cases the condition may have lasted but a few days, in the severe cases this has been increased to many weeks, with much suffering during that period.

The second group of cases were those in which the chief symptom and disability consisted of instability of the shoulder joint with recurring dislocations of the head of the humerus. The exact cause of this condition did not seem to be clearly understood, and as none of the methods of treatment were constantly successful it seemed probable that there was some other element, which if understood would make the certainty of success much greater. The annoyance which such a condition represents is very great, and the ease with which such dislocations occur causes much inconvenience, as well as at times considerable suffering.

The third group of cases comprised those in which pain was present in the arm, frequently referred to definite points, sometimes to the distribution of a single nerve, most often the ulnar.

The pain in the arm was often associated with pain about the shoulder, but quite as often this pain did not exist. The pain was not associated with peripheral inflammation, was not aggravated by pressure over the seat of the pain or over the course of the nerve, was not associated with change in the reflexes or other features indicative of disease of the central nervous system, but was always made worse by certain changes of position and such features as would suggest a mechanical element as a part of the cause at least. These cases have usually been spoken of as neuritis, and have apparently yielded indifferently to treatment.

These three groups of cases, while differing widely clinically, are considered together in this paper, as the studies seem to show that the anatomical features which are to be described are similar in them all, and also because many of the principles of treatment are the same.

ANATOMY.

In order to properly understand the subject a careful consideration of the anatomy of the shoulder is necessary.

In its skeletal part the shoulder is made up of three bones, the clavicle, the scapula, and the humerus; the first two being joined together at an acute angle and resting saddle-fashion upon the side and upper part of the thorax. The clavicle is attached at its inner end to the upper part of the sternum, this being the only bony attachment of the arm to the trunk. The outer part of the clavicle, which is flat, forms a narrow articulation with the anterior and the inner edge of the acromion process. It is also joined to the scapula by means of the coracoclavicular ligament, which is attached to the underside of the clavicle and to the coracoid process. These attachments allow a few degrees of motion between the clavicle and scapula, so that the angle between them can be varied slightly, as well as allowing an up and down motion, so that in raising the shoulder the vertical axis of the scapula need not be changed. The shoulder-joint is formed of the glenoid cavity, against which the head of the humerus rests, and this is rendered more stable under ordinary conditions by the coracoid process in front and the acromion process above

and a little at the back of the joint. The bones are naturally held together by ligaments, which under ordinary conditions give the greatest stability that would be in keeping with the freedom of motion.

In studying the mechanics of the shoulder in connection with the anatomy it is at once apparent that much of the motion commonly supposed to be made in the shoulder-joint proper is either made in or allowed by other joints and structures which are adjacent. For instance, it is entirely possible to shrug or raise the shoulder or to carry the shoulder well forward, the so-called drooping, without the arm being moved from the body, or, in other words, without the shoulder-joint proper being moved at all. The greatest range of motion of the shoulder is made by the scapula sliding over the ribs, and while this is not considered a joint, it must nevertheless be considered in understanding the mechanics of the shoulder. Unlike the true joints, in this scapular movement the amount is not limited by bony sockets or firm ligaments, but by elastic muscles, so that the exact amount is not constant. In this, however, as in all of the movements of the shoulder which involve movement of the scapula, it must be remembered that at the same time in connection with this there must be motion in both the acromioclavicular and the sternoclavicular articulations. The former is practically a hinge-joint allowing about twenty-five degrees of variation in the angle between the clavicle and the spine of the scapula, the restraining feature being the coracoclavicular ligament. The sternoclavicular articulation suggests more a ball-and-socket joint, as motion in several different planes is allowed. The range of motion in this either up or down or forward or back or in rotation is not very great, but the result of the motion seen at the shoulder, transmitted as it is through the entire length of the clavicle, is considerable.

In the work that is here being described one of the first things that was apparent was that when the bones are in their normal position, their relations are different from that which is commonly pictured in the text-books. The impression that one gets from these is that the acromion process is well above the humerus,

and that the coracoid process is also above the humeral head in front or at least on a level with the top of it. This is clearly so in the dissected preparation if the scapula is held flat to the view, but in the normal relation to the other

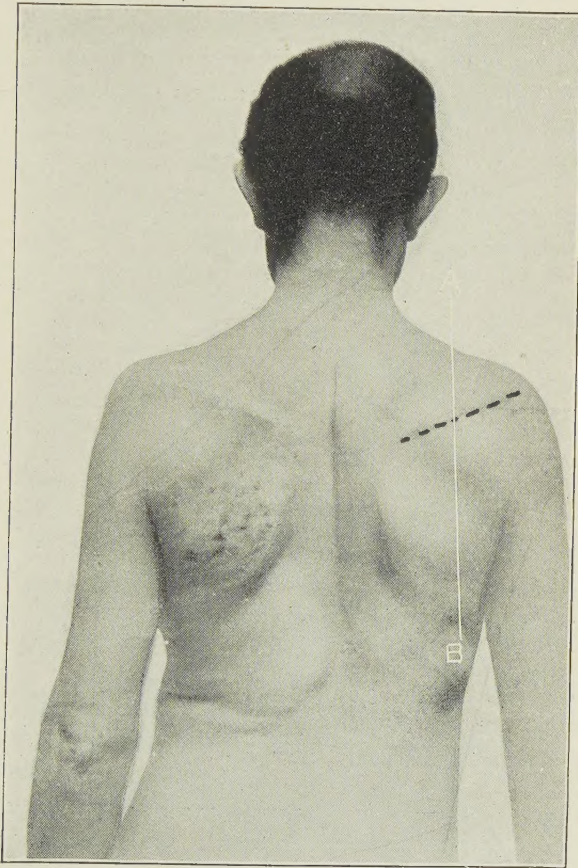


FIG. 1.—Shoulders held erect. The dotted line showing the line of the scapular spine.

parts not only is the plane of the body of the scapula changed so that it is oblique, extending forward and upward, and because of this both the acromion and coracoid processes incline forward, while the acromion process is nearly horizontal

in its plane and the coracoid has usually a distinct inclination downward. In most of the anatomical drawings the coracoid process is shown with a distinct space between it and the humerus, while actually these two bones are in close apposition, the tip of the coracoid resting against or being opposite the lesser tuberosity

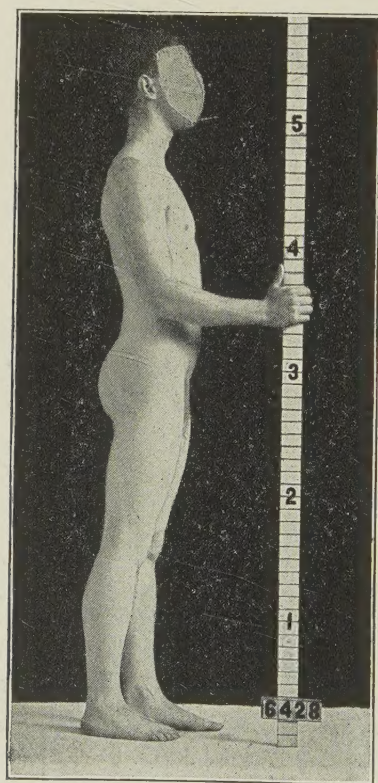


FIG. 2.

of the humerus. The amount of contact between these bones depends upon the shape of the bones and the position of the shoulder with reference to the rest of the body. If the shoulder is held erect with the scapula flat upon the ribs at the back (Figs. 1 and 2), the bones are not actually in contact unless the arm is rotated inward or drawn toward the center of the body,

but the separation is only very slight and the position of the coracoid process is even under these conditions distinctly below the top of the humerus. If the shoulder is allowed to droop the whole shoulder is rotated forward, outward, and downward, so

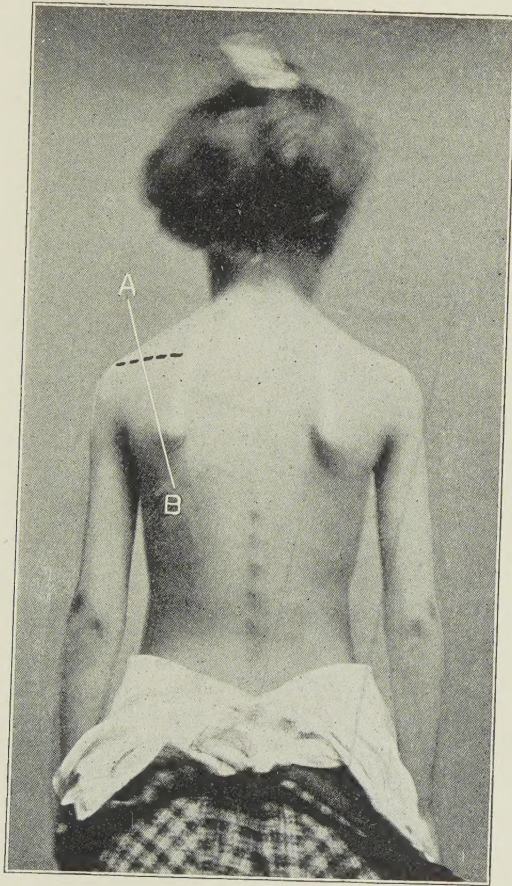


FIG. 3.—Marked round shoulder. Showing the so-called angel wing scapulæ.

that the scapula faces upward and outward (Figs. 3, 4, 5), much more than in the erect posture, and not only this, but the perpendicular axis (Fig. 1) of the scapula is also changed and inclines more to the outside (Figs. 3, and 5). The axis of the bone with reference

to the anteroposterior position is well shown in Figs. 2 and 4. In this rotation the coracoid and acromion processes naturally are brought forward and downward, and the point of contact of the coracoid process with the humerus is made necessarily lower

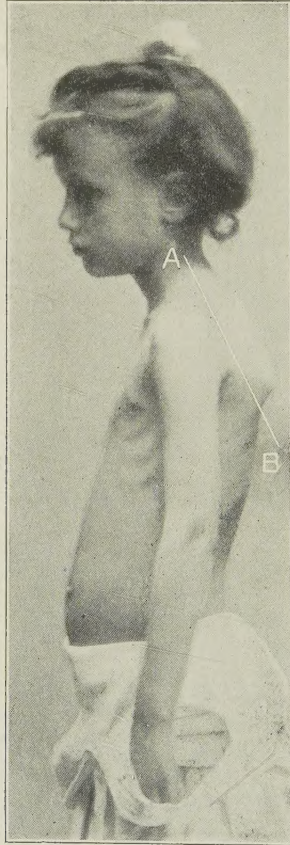


FIG. 4.

and must be more constant, especially since in this forward position the capsule of the shoulder-joint is relaxed, and the natural drag of the arm downward and forward must bring the bones more firmly together.

The effect upon the stability of the joint of this change of the

position of the shoulder is a matter of considerable practical importance, and in a fairly large number of observations made by the writer upon the living subject it was shown that there is

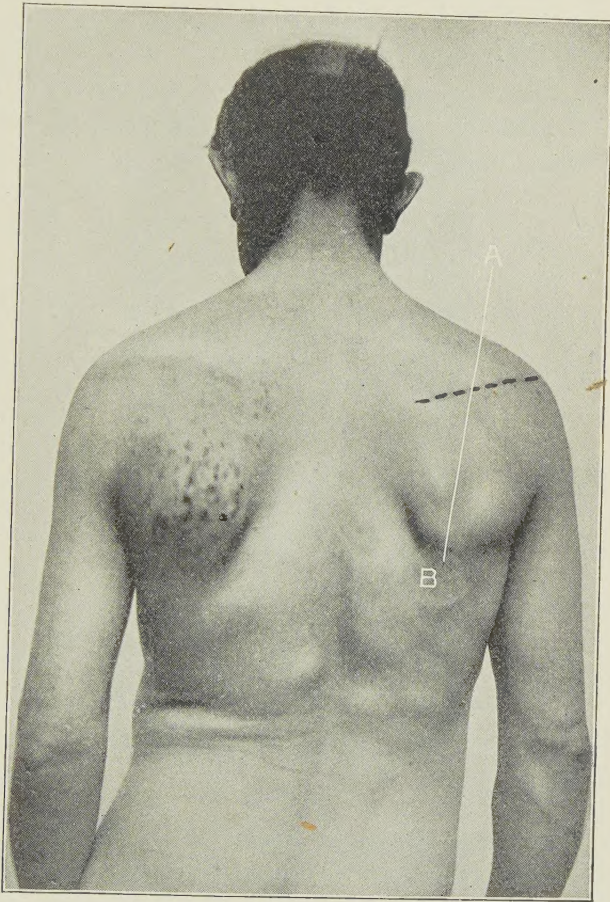


FIG. 5.—The shoulders drooping. The line of the scapular spine also shown.

from fifty to sixty degrees more motion in rotation of the humerus in the glenoid cavity than is possible when the shoulder is held erect. In other words, the erect position is the position of greatest stability, while the forward position or the stoop-shoulder

attitude is the position of greatest instability—facts which should be considered, especially in treating shoulder dislocations.

The next fact that was apparent was that the length and angle of the coracoid process is not constant, so that the degree of contact between the coracoid and the lesser tuberosity must vary within very considerable ranges. Not only is this true, but the same thing is true of the acromion process, and both of these factors are of much importance in the matter of the function and stability of the shoulder-joint.

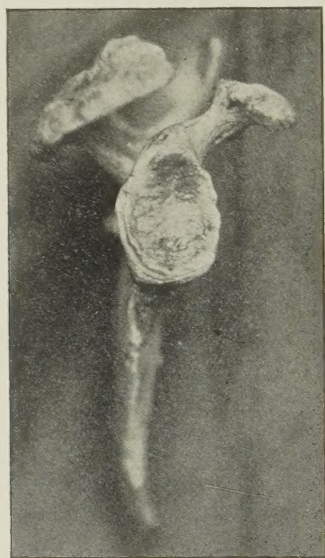


FIG. 6.

The coracoid process may be short (Fig. 6) or long (Fig. 7). It may project upward (Figs. 6 and 8) as well as forward, or it may project downward (Figs. 9 and 10). The forward inclination also varies (Figs. 6 and 11). With the acromion process the variations are also striking. The length and breadth of the process as well as the axes of the process in relation to the axes of the shoulder-joint are not constant. The process normally faces upward and backward, its axis drawn through the length of the bone being upward and forward about 35 degrees from

the horizontal. Its position normally when the body is erect is such that it is almost entirely above the line of the joint, dropping below only slightly at the back. The variations in this axis are quite marked, as is shown in Figs. 6, 7 and 11. Because of this variation in the position of the acromion process, combined



FIG. 7.

as it often is with an increase in the length of the process (Figs. 8, 9, and 10), the character and amount of the motion in the shoulder-joint must naturally vary.

MECHANICS.

The effect which the peculiarities in the shape of these bony processes must have upon the movements of the shoulder-joint is a matter of much importance as a cause of joint instability or of inflammation. Naturally, the greatest amount of motion in

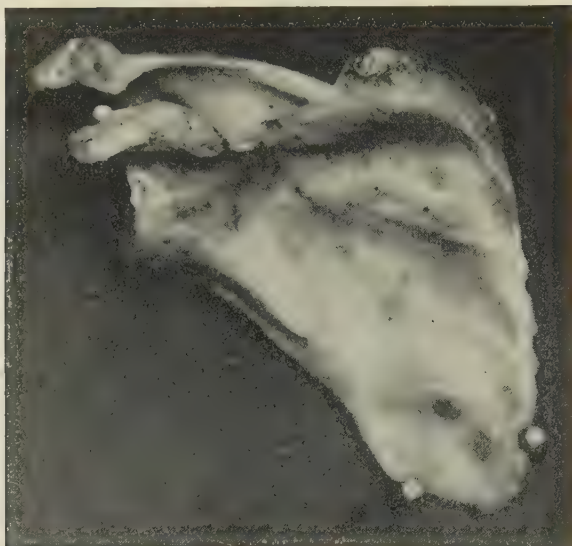


FIG. 8.



FIG. 9.

the shoulder will be possible in the cases in which there is a short acromion set in the common position above and but a little behind the joint, with the coracoid process short, with the least downward inclination. If, however, the coracoid process is long, and especially if it inclines downward, the motion of the arm forward will naturally be limited because under such conditions the lesser tuberosity of the humerus impinges against the tip of the process more forcibly and earlier in the movement

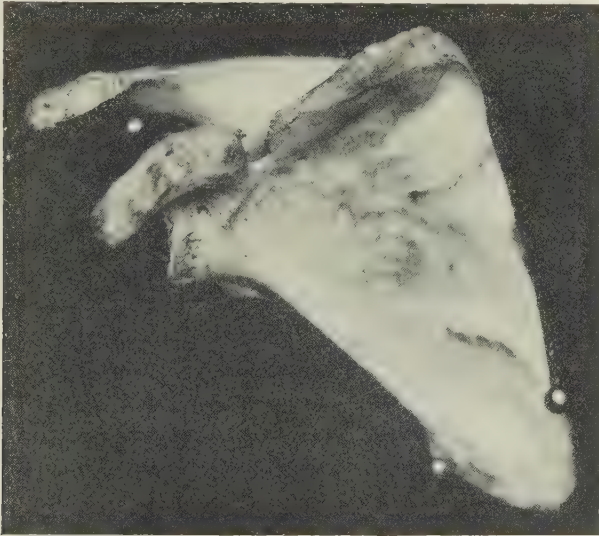


FIG. 10.

than if the process were short with the upward inclination. If the acromion process is longer than normal it will naturally limit the raising of the arm over the head, while if the process is placed more at the back of the joint than is normal the movement of the arm backward will also be limited. This deepening of the cavity of the shoulder-joint, which is the practical result of these elongated processes, would naturally suggest an increase in the stability of the joint, and while under certain conditions this is the actual result, under other conditions in the same individual, the stability is materially lessened for the following

reasons. If the acromion process is longer than normal it is evident that if the arm is raised straight from the side and carried over the head, or if, especially when the acromion is placed more at the back of the joint than normal, the arm is carried backward as well as raised, the greater tuberosity of the humerus strikes against the acromion process, with the result that if this motion



FIG. II.

is continued the acromion process represents the fulcrum of a lever and the head of the bone tends to be forced out of the glenoid cavity. If the force applied under such conditions is sufficient, the separation of the head of the humerus is enough for a true dislocation to take place. If in connection with this application of force the stability of the joint is less than normal, as may result from previous dislocation or inflammation, in which case

the capsule is relaxed, dislocation will naturally take place more easily. Under such conditions from the method of the application of the force the displacement would be with the head of the bone either forward or downward.

While such results are possible when the acromion is abnormally long or peculiarly shaped, a similar condition will also result if the peculiarity of the shape is in the coracoid process. If this is long, or especially if it is inclined downward, when the arm is carried forward the lesser tuberosity of the humerus is brought in contact with the tip of the process and the head of the humerus is lifted out of the glenoid cavity if sufficient force is applied. In this case the coracoid process acts as the fulcrum instead of the acromion. In the forward position, because of the fact that the anterior ligaments are short and firm, when the head of the bone is lifted from the glenoid cavity it must either slip off the upper side of the coracoid process, in which case it falls back into the cavity, being forced in by the acromion process above, or it slips off the coracoid process below, in which case an anterior or subglenoid dislocation takes place. If the anterior part of the capsule has not been torn as part of the violence, the anterior position, with the head resting directly under the coracoid process, will be the invariable rule, since the short anterior ligament must restrict the range of motion, making more remote positions impossible.

In all that has been stated thus far no other conditions have been considered than those which represented either congenital or acquired peculiarities of anatomical form, entirely apart from disease or other conditions. It is evident that in such conditions as have been described that if either or both of the bony processes are long or peculiarly placed that the constant strain upon the joint capsule which such mechanical features would cause must weaken the capsule of the joint, so that further strain with greater possibility of ultimate displacement of the bones must naturally result. If these anatomical peculiarities are very marked it is easy to understand the ease with which dislocation takes place, even though no great violence has ever been a factor in the joint condition. When such conditions exist and a violence is re-

ceived with resulting dislocation, in the tear of the ligaments which such a violence may represent the capsule will be still further weakened, and this being the case it is easy to see that the subsequent dislocations can take place much more easily than would have been possible but for this first violence. In the history of the causes of recurrent dislocation of the shoulder-joint not infrequently the difficulty dates from a traumatic dislocation, but in most of these cases it is evident, with this better understanding of the anatomy and mechanics of the joint, that the subsequent displacements are largely due to these anatomical peculiarities which were present before the trauma. It is also probably true that in many of the cases the first displacement would not have taken place had not these anatomical peculiarities existed, and it is certain that the greatest stability of the joint cannot be obtained until these peculiarities are recognized in planning the treatment.

It is not to be inferred from this that the writer considers that all recurrent dislocations of the shoulder-joint are due only to these two factors, *i.e.*, the anatomical peculiarities of the coracoid and acromion processes with relaxation of the capsule, because other elements are at times present, but in no case which has come under his observation has the existence of these anatomical peculiarities with the relaxed capsule not been present, and the final cure has depended upon their recognition, even though other conditions may also exist. With the more general recognition of these two features operations will undoubtedly be less often required than was formerly necessary.

The conditions most often seen as contributing factor to the displacement have been adhesions in the subcoracoid bursa, to be described later, or rupture of the tendon of the infraspinatus muscle, described by Dr. Codman, while in one case a piece of the glenoid cavity had been broken off, this partially loose fragment acting as a fulcrum to pry the head out of position, but even in this last case the stable joint was not obtained until the use of the joint was controlled so that the striking of the head of the humerus against the coracoid or acromion processes was impossible.

BURSÆ.

To prevent undue irritation from the impingement of the bones at these processes during use, bursæ exist, and these become of much importance in our understanding of the clinical conditions met with at the shoulder-joint. The subdeltoid, or subacromion, bursa is situated under the acromion process outside of the capsule of the shoulder-joint and extends over the greater tuberosity of the humerus, out under the upper part of the deltoid muscle. In raising the arm from the body at the side the surfaces of this bursa naturally glide over each other, and if for any reason the bursa becomes inflamed the motion will be attended with pain, or if such inflammation exists or adhesions have formed the motion will be limited. This bursa, which has been best described by Dr. E. A. Codman (*Boston Med. & Surg. Journal*, October 22, 29, Nov. 5, 12, 19), from its exposed position is especially liable to injury and is undoubtedly the cause of many of the cases of so-called periarthrititis.

At the coracoid process a bursa, the subcoracoid or the coracobrachialis, also exists, this being situated between the tip of the coracoid process and the outer surface of the capsule of the shoulder-joint as it extends to and over the lesser tuberosity of the humerus. While this bursa is less exposed to external violence, it is much more liable to injury, since much of the use of the arm or in the common attitudes which are assumed the bursa is subject to irritation from the pressure of the lesser tuberosity of the humerus against the coracoid process.

CLINICAL CONSIDERATIONS.

Thus far purely anatomical and mechanical conditions have been chiefly considered, apart from any pathologic element, and while many of the cases possess no other factors of importance, with others, however, the pathologic changes become important. If the bursæ become inflamed or injured the clinical picture is characteristic. With the subdeltoid bursa the pain is usually referred directly to the location of the bursa or to the

deltoid muscle, frequently to the attachment of this muscle to the humerus. The limitation of motion under such conditions is, as would be expected, chiefly in abduction or the raising of the arm from the body at the side. Since both the supraspinatus and the deltoid muscles are concerned in making this motion, and since the bursa lies between these outside of the tendon of the supraspinatus muscle, which is the upper part of the capsule of the shoulder-joint, and under the acromion process as well as the deltoid muscle, this limitation is easy to understand. Flexion or extension of the arm without raising it from the side is, as a rule, quite free, and rotation, unless it is performed with raising the arm, is also but moderately limited unless adhesions have formed between the bursal membranes. Rotation with abduction of the arm will naturally be limited, since in this motion the bursal membranes are compressed between the acromion and the greater tuberosity of the humerus, as well as strained from the pull of the supraspinatus deltoid muscles. If adhesions have formed the motion will be and constantly limited in the directions indicated, and the extent of the limitation will depend upon the extent of the adhesion formation. If the cavity of the bursa is fully obliterated all rotation and nearly all of the abduction in the shoulder-joint will be impossible. Even when the bursal sac has been quite obliterated flexion and extension with the arm at the side may be quite free.

If, as the result of simple posture, such as would occur if the shoulder were habitually carried forward (the round- or stoop-shoulder attitude, Figs. 3, 4, 5), the lesser tuberosity of the humerus rests against the tip of the coracoid process, as it must in this position, or if, as a fact of occupation, the arm is used so that these two bones are in contact more constantly or with more force than is normal, then the bursa which lies between these two structures becomes inflamed exactly the same as the prepatellar or the olecranon bursæ become inflamed in occupations or postures in which these bursæ are definitely injured or repeatedly strained. Because of the position of the sub-coracoid bursa and its almost constant use in motions of the shoulder it is un-

doubtedly more often inflamed or affected by violence than any of the other bursæ about the shoulder-joint.

If such an inflammation of the bursa occurs, there will naturally be pain and sensitiveness, with limitation of motion during the acute stage, with either an entire disappearance of the symptoms as the inflammation subsides, or if adhesions have formed as a part of the inflammation there may be an entire disappearance of the pain and tenderness, but the limitation of motion will persist. This limitation of motion of the shoulder-joint, which will be present in case adhesions have formed within this bursa, will be such as one would expect if the anterior part of the capsule of the joint were attached to the coracoid process, since as the bursa lies between these two structures, this is what occurs. Such an adherence of these structures would not interfere materially with the flexion or extension of the arm as long as the motion is made in an anteroposterior plane, or with raising the arm from the side if the motion is made in a purely lateral plane, since in all of these motions the subcoracoid bursa is comparatively little used. If, however, rotation is attempted, either with the arm at the side or with the arm raised, the limitation is at once apparent, since in rotation the lesser tuberosity of the humerus must either glide over (in inward rotation) or move away from (in outward rotation) the coracoid process, and it is apparently to allow this motion without friction that the bursa exists. If the surfaces of the bursa are adherent or inflamed the limitation of this motion would naturally be expected. It is this limitation that makes difficult the putting on of a coat or similar garments, the doing of the hair, the fastening of the bands of shirts, etc., all of which involve marked movement of these bones in rotation one upon the other. Other motions, however, may be made freely, because in these the lesser tuberosity of the humerus and the coracoid process do not materially change their relations.

If an inflammation of this subcoracoid bursa has once taken place and if adhesions have formed, the character of the shoulder-joint motion must necessarily be changed. If the adhesions are few or the membranes are not held tightly together, the change may be slight and of comparatively little importance. If, how-

ever, the adhesions are firm and, as often takes place, the bursal cavity is entirely obliterated, this change then becomes of much importance, since it means that the tip of the coracoid process becomes the center about which all of the shoulder-joint motions must be made. In flexion or extension the head of the humerus can no longer glide under or away from the coracoid as is normal, but the head of the humerus must slide in and out of the glenoid cavity, the amount being limited by the capsule and the bony structures. Rotation will not only be limited more than the other motions, but if the adhesions are firm outward rotation of the arm will be impossible, since in this the head of the bone is simply pressed more firmly against the bottom of the glenoid cavity. In inward rotation what little motion may be present is the result of lifting the head of the bone out of the glenoid cavity, the coracoid process acting as the fulcrum over which the bone is drawn. In both of these motions it is to be remembered that even though the limitation just described may be marked, the motion at the acromioclavicular articulation, with the movement of the scapula over the ribs may compensate for the limitation to a moderate degree.

If, now, such a condition exists and for any reason the capsule of the shoulder is relaxed, it is at once apparent that the stability of the joint must be lessened. Under such conditions, if the arm is raised upward and at the same time rotated, dislocation of the head of the humerus is an almost natural result. In such movement the bone is simply lifted out of the socket, and if at the same time there is violent muscular effort or any of the muscles, especially the biceps acting through the long head, are thrown into spasm, dislocation is to be expected, and since the lesser tuberosity of the humerus remains in contact with the tip of the coracoid process, the displacement will naturally be with the humeral head under the coracoid process, the subcoracoid or anterior position.

Of the subjective symptoms commonly present in these cases, pain is one of the most common and this may be referred definitely to the region of the bursa, or if the inflammation is more general or extensive the distribution of the pain will also be more general.

If the coracoid bursa is the one involved the pain is usually located just outside the tip of the coracoid process. At times pain is referred to the deltoid region or down the arm, the region of the attachment of the deltoid to the humerus being a common place, or along the course of the ulnar nerve. Occasionally the whole arm and hand is painful, and with this there may be disturbance of circulation, the whole condition appearing like a true neuritis.

If there is an active inflammation present of either the subcoracoid or the subdeltoid bursa the pain will naturally be present as long as the inflammation continues, but it will be aggravated by use or position in which strain is produced upon the parts inflamed. If, however, no true inflammation exists, then the pain, which may be very severe at times, will be relieved or aggravated by change of position. Under such circumstances the pain is often most severe at night, usually coming on in paroxysms and being relieved by simple change of position. The reason for this is readily apparent when the mechanical and anatomical conditions which have previously been described are recognized. Before sleep the arm is placed in some position of ease, usually with the forearm across the body, with the patient upon the back. In this position the elbow and upper arm are not supported, but depend upon the position of the forearm with the contraction of the muscles for the preservation of the posture. With sleep the muscles naturally relax, and the arm and elbow drag down to the side, the forearm being drawn off its position upon the front of the body until the elbow and arm rest upon the bed. In this movement the arm is naturally rotated outward, and this must strain the area of sensitiveness. This strain continuing finally wakens the patient and it is not until the position is changed that the pain, which is usually referred to the anterior part of the shoulder is relieved. Support of the elbow so that this rotation cannot take place should practically prevent pain due to this cause.

BRACHIAL NEURALGIA—NEURITIS.

In many cases pain is referred to the arm and hand and fre-

quently referred definitely to the distribution of a special nerve, most often the ulnar. This condition may be seen in connection with a distinct inflammation of the bursa about the shoulder, or there may be evidence of no such bursal involvement. The pain under these conditions is not associated with inflammation of the nerve sheaths showing by pressure along the course of the nerve, nor are there motor or sensory disturbances other than represented by pain. Drugs or external applications, are as a rule, of little help or other than temporary relief, and the fact that the chief relief usually comes from attitudes or change of posture which the patient has usually learned by instinct suggests a mechanical element as a cause of the trouble. The resting the arm upon pillows at night with the elbow raised from the side, the sitting posture for sleep, the forward position with the arm resting upon a table, all attitudes often assumed by patients with this type of pain, suggest something other than primary nerve or nerve sheath lesions as a cause of the trouble.

In studying this type of case it was noticed that the forward position of the shoulder as the habitual attitude was constant, and that the pain was increased in proportion to the increase of this droop. It was noticed that in the slender persons the pain was almost always referred to the distribution of the ulnar nerve, while in the persons inclined to be stout the pain was more general as if all of the nerves of the arm were involved. It was noticed that while frequently the bursæ were involved, this was not always the case. It was also noticed that inward rotation of the arm usually caused an increase of the pain, while raising the arm from the side with the raising of the shoulder usually gave relief.

In the anatomical studies which were then undertaken it was at once apparent that with the drooping shoulder the posterior muscles are strained more and more as the droop increases and finally the head of the humerus rests against the ribs. In this position the ulnar nerve lies almost directly under the head of the bone, this being the most posterior of the branches of the plexus, and is pressed upon as it crosses the second rib. If the subcutaneous fat tissue is present in considerable amount the

pressure exerted is more apt to be of all the axillary structures, the pressure upon the individual nerve being less easily possible, and the more general pain is the result.

Recognizing this, the understanding of the pain with the relief obtained by the various positions instinctively assumed by the patients is simple. Not only does this explain some of the obstinate cases of neuritis of the arm, but also some of the cases of writers cramp. In these latter cases so far as it has been possible for the writer to observe them, the pain has always come on after writing at a desk or sitting with the body inclined forward. When such an attitude is first taken there usually is no pain, but if it is maintained for any length of time the pain develops and increases the longer it is maintained. This is of course, in keeping with the *faigue* of the muscles, which allows the shoulder to sag forward. At first the position is with the body reasonably erect, but as the posterior muscles tire the forward inclination of the body becomes more and more marked until the final position is with the body much flexed and supported almost entirely by the table, the arms under these conditions being used with much difficulty. Under such conditions, with the inclination of the trunk forward, the shoulder muscles also are strained so that the shoulder itself droops more and more forward, and as the arm carries some of the weight of the upper part of the trunk, the head of the humerus is crowded more and more firmly against the ribs, with the effect that if the nerves of the brachial plexus lie under this they are compressed more and more until not only does the pain become intense, but temporary paralysis of the arm results.

TREATMENT.

The treatment of the different conditions here described depends so entirely for its essential features upon the anatomical and mechanical elements that have been mentioned that the treatment of all the types, although widely different clinically, is practically the same except for minor details.

Once recognizing that the stability of the shoulder-joint becomes less as it is carried forward or droops, together with the

fact that the peculiarities of the coracoid and acromion processes in this forward position distinctly interfere with motions which in the upright position would be made freely, that also in this forward position the subcoracoid bursa is compressed between the lesser tuberosity of the humerus and the coracoid process, and that in this forward position the axillary structures, especially the nerves, are crowded against the ribs, then recognizing all of these things, the first requisite in treatment consists in the changing the forward position of the shoulder so that it is held erect.

In this the relations between the coracoid and acromion processes and the humerus are changed so that there is no undue pressure upon any of the structures; the stability of the shoulder-joint is increased so that displacements are difficult of occurrence; the bursæ are no longer unduly irritated, and the axillary structures cannot be compressed.

In the irritation or the inflammation of the bursæ, especially the subcoracoid, if no adhesions are present, the mere change of attitude may cause marked relief at once. At other times when the inflammation is more severe the relief is not as immediately noticeable, but if the erect position is maintained the compression of the bursa which must occur in the forward position no longer being present, the inflammation will gradually subside. If adhesions are present, the pain is sometimes increased in the attempt to hold the shoulder back, since in this position the adhesions are stretched. Under such conditions, or wherever adhesions are present, these should be overcome if we are to expect the normal use of the arm. In case such a procedure is contemplated if there is much inflammation of the bursa, as shown by acute pain or tenderness, it is well to keep the arm quiet for a few days until this inflammation has lessened before manipulating.

Manipulation.—In the manipulation if the trouble is at all marked, an anesthetic should be used, and as only a few moments are required, nitrous oxid is usually sufficient. The limitation of motion where the subcoracoid bursa is involved is chiefly in rotation, but in the manipulation rotation should not be attempted at

first as the adhesions are often so firm that a spiral fracture of the humerus may result, and as the writer has seen this occur once in the hands of a colleague it is not a fancied possibility. The arm should first be flexed and extended in the anterior posterior plane as much as possible and should then be raised from the side, one hand grasping the elbow, the other holding the shoulder so that the scapula does not move and deceive as to that which is being accomplished. As the arm is raised, after a right angle with the body has been reached, then as the arm is carried higher it should at the same time be rotated outward until when it is vertical it is outwardly rotated to the full normal amount. In this combined rotation and abduction the bursal membranes must be separated with the rupture of the adhesions, and the force is applied in such a way that there is no danger of injury to the bone. After this motion has been made then both inward and outward rotation with the arm at the side should be tested, and while usually this will be possible to the full amount, if any adhesions remain they can be easily overcome.

After the full motion has been obtained the shoulder should be held fully extended so that the scapula rests upon the ribs at the back, and this can be best accomplished by adhesive plaster strapping. If for any reason this is not available, then bandages or sand bags should be used for the same purpose, recognizing that in this position with the shoulder thrown back the surfaces of the bursa are separated and consequently the liability of fresh adhesions forming is reduced to the minimum. Quiet for a day or two should be encouraged, and during this period local heat in any form will be of help, after which the patient should be allowed to go about, encouraged in the use of the arm, but always with the shoulder erect. Usually no further trouble results. Occasionally, however, the peculiarity in the shape of the coracoid process is such that ordinary use of the arm is attended by irritation at that point so that it becomes a matter of serious consequence. Under such circumstances, in case the scapula can be held in its right position so that the trouble at the tip of the process is due entirely to the peculiarity in its shape, then if other things have failed an operation should be performed and enough

of the end of the coracoid process be removed to allow the motion without this obstruction.

If the symptoms are those of acute inflammation of the bursa, rest in positions in which there is no strain, with local heat, the application of cauter, or similar measures, will usually be all that is required, and if no previous trouble has been present, motion should be started in a few days so that adhesions cannot form.

RECURRENT DISLOCATIONS.

If the chief trouble consists in the instability of the joint so that repeated dislocation occurs the erect position of the shoulder should be tried first, since in this position fifty to sixty degrees less of rotation of the head of the humerus in the shoulder-joint is possible, and this in itself may be enough to correct the lack of stability. In one very obstinate case which the writer has seen, in which nothing short of an extensive operation seemed to promise relief, the effect of position was tried and with six months of use of a brace to maintain this position no further trouble has occurred in two years of free use of the arm, while previous to the change of the position of the shoulder the dislocation frequently followed very slight movements, such as raising of the arm or the putting on of the coat.

In certain cases of injury, as Dr. Codman has shown, the tendon of the supraspinatus muscle may be ruptured and the instability of the joint be such as to make it advisable to suture this in place. If, as the result of injury loose pieces of bone exist in the joint, as in one case which the writer has seen a piece of the glenoid cavity had been knocked off and was free, these should naturally be removed. At other times the peculiarity in the shape of the coracoid process is such that it must exert a definite influence in the dislocation, and under such circumstances enough of the tip of this process should be removed so that this source of difficulty no longer exists, but whatever operation is performed or whatever the procedure the position of the shoulder afterward with the scapula, flat at the back should be insisted upon. Anything short of this leaves the work only

half done and the joint is left with less stability than should be secured. Unless this is recognized many operations will fail, and if it is recognized many operations will not be necessary.

BRACHIAL NEURALGIA—NEURITIS.

In case the symptoms are of pain in the arm or hand, the so-called brachial neuralgia or neuritis, the same correction of the position of the shoulder becomes necessary, and with the adhesive



FIG. 12.—Showing short upper part of scapula with this portion flexed forward.

plaster strapping or braces this can usually be accomplished with entire relief of the symptoms. In one case which the writer has seen, however, the correction of the position in this way was not possible. The patient was a journalist, thirty-five years of age, who had always had sloping shoulders, and always stood with the body bent forward. For a year and a half previous to

his being seen he had had intense pain in the arm whenever he attempted to write so that dictation in everything became necessary, but even with this whenever the body was inclined forward more than usual for a short time the arm pain developed and was so intense that the patient's general health was becoming much impaired. At the time of the first examination the mechanical feature was recognized, but it was also recognized that the upper part of the scapula was flexed sharply forward (Fig. 12, as described in "A Consideration of the Round- or Stoop-shoulder Deformity," AM. JOUR. OF ORTHOPEDIC SURGERY, April, 1908) so that when the attempt was made to carry the shoulder back the tip of the scapula crowded into the ribs and caused pain at that point. To unconsciously relieve this pressure the scapula was rotated so that the long axis in its upward inclination was directed farther to the outside, but this naturally lowered the glenoid cavity, and in this the brachial plexus was again compressed, so that in spite of all that could be done by simple means the mechanical conditions causing either the compression of the brachial plexus or the crowding of the tip of the scapula into the ribs persisted. After reasonable trial of nonoperative measures unsuccessfully, an operation was performed, in which the flexed upper angle of the scapula was removed, and following this the shoulder could easily be carried erect with the entire disappearance of the pain, so that free motion of the arm is now possible. With the disappearance of the pain and the ability to use the arm in the normal position, and at the same time with the ability to stand erect, there was not only a return of the full power of the arm, but marked improvement in the general health, the same as had been seen in the other cases of like nature.

II.

BONE PATHOLOGY IN ITS RELATION TO GENERAL PATHOLOGY.

BY SYDNEY M. CONE, M. D., BALTIMORE, MD.

For the need of a simple technic much good material in bone pathology goes to waste. Much valuable material at autopsy has been overlooked because of the absence of a bone technic which could be easily and quickly followed. Many simple things in bone histology are considered difficult and not referred to at all because they are not made a part of the routine study of our autopsy material. There is no good reason why we should not study bone at autopsy and at the operating-table as carefully and as systematically as we study other tissues and organs.

Bone is subject to the same general pathological processes as the soft parts modified only by its hardness. It is not commonly known that bone changes exist, corresponding to those in the other tissues and organs of the body when general pathological lesions occur elsewhere.

It would seem that much valuable material has been overlooked at our autopsies when, every tissue and organ having been most minutely studied to aid in summing up the anatomical diagnosis, the bone structure itself—unless grossly involved—has been left unexamined.

The heart or liver may be never so little involved, yet it is sectioned and carefully studied. Not infrequently the pathologist is surprised to find changes where none were suspected. Surely, much additional information is obtained about generalized pathological processes by studying every organ or tissue involved. It may be that similar general (fundamental) pathological proc-

esses appear alike in the various organs, but where there is even a little difference there is something to be learned about the general processes as well as added knowledge about the generalized process in the body. It is with the object of bringing bone into the general view and thus aiding in its study in a general way at our autopsies and at the same time demonstrating some things noted in bone related to other tissues that I am writing about a simple technic in its study.

As usually carried out, the study of bone is a laborious one. There are many things that may be seen in decalcified, microtome cut sections of bone, but none of these will be missed in the simpler technic. On the other hand, decalcification loses for us much that we can see by the free-hand sectioning of fresh bone. Much of my work has been done with both decalcified and non-decalcified material from the same case, most of it had to be done with fresh undecalcified bone.

The general method is the same as used in Von Recklinghausen's laboratory in studying general and special pathology. He recommends the free-hand sectioning of fresh or hardened tissues by a razor flat on one side, staining, mounting, and examining at once in salt solution or glycerin.

It is much easier to make a satisfactory free-hand section of bone than of lung or liver, but one must be content with small pieces, 1 cm. in size at most.

What difficulties are encountered here are more than compensated for by the fact that the gross specimen keeps its shape so that we may locate the histological changes as if by serial sections, each section being referred to its proper place during the intact condition of the specimen under examination. For example: take a case of syphilis of the tibia, the epiphyseal line being involved in case of congenital syphilis in a fetus. The yellow jagged line having been noted, material was taken from the center of this, the degenerated material examined, then the bone was studied at varying distances toward epiphysis and shaft, the marrow, cancelli of spongiosa, lamellæ of cortical bone and cartilage being taken in turn. Numbers of pieces were studied to verify the findings.

Other advantages are noted: the bone salts may be studied in relation to bone pathology; there is less handling of the specimen, which is of value where loosely-held osteoclasts are present; pigment is not so likely to be removed or destroyed; the bone cells and canaliculi are left intact; Virchow's bone territories may now be seen in their natural form, being left in relief by bone salts which are still present; the lamellar system is *not* so injured by acids (used in decalcification) as to be of little or no use in diagnosis.

This method of studying bone has the same advantage over the more painstaking, slow, decalcifying, embedding, microtome cutting method that the study of fresh, teased, or free-hand sections of soft tissues has over the longer processes.

One interprets at once by means of the microscope, while fresh in his mind, the gross appearance of the tissue. He learns what a cloudy area is due to, what causes the gray or yellow jagged line at the epiphyseal margin in syphilis, what produces the soft pinkish-gray tissue in the osteophyte of a cancer metastasis, what the opalescent translucency in another harder cancerous focus—an unusual cartilaginous new-growth being there.

It is essentially a practical method of studying gross pathology of bone by the microscope—a clinical (surgical) pathological method.

The method of preparing specimens for examination follows: Using a scalpel of very hard steel, slice off a very thin piece of bone—the size usually measures 4 mm. If it be spongiosa, take an entire piece, or if too thick it may be cut finer or broken and teased. (One must be warned that sections cut of varying thickness may allow of different injection of lacunæ and canaliculi and different appearances of the bone.)

The bone may be stained or examined without staining. The stains most commonly used were hematoxylin, carmin, osmic acid, acid fuchsin and scharlach R. Acid was commonly used but for a moment to wash out excess of stain and help the injection with gas.

As a rule, I use hematoxylin, mounting in glycerin or salt solution. Salt solution has the advantage of giving a better in-

jection of the canaliculi and Sharpey's fibers (see Von Recklinghausen in Virchow's *Festschrift*, 1891).

Von Recklinghausen in Virchow's *Festschrift*, 1891, gives his technic and describes some very interesting changes in some chronic diseases of bone—"fibrous ostitis, osteomalacia, and carcinoma of bone." His method consisted in hardening in alcohol or Müller's fluid, cutting thin pieces without decalcifying, and staining these with carmin or anilin dyes. He refers especially to the significance of the air injection of the canaliculi and Sharpey's "fibres." The parts which do not contain salts stain deeply (on the contrary, in our technic the salts take the hematoxylin stain, the osteoid and fibers remaining unstained).

He also passed from absolute alcohol to ether or chloroform, dried quickly and mounted in glycerin. To bring out the canaliculi and larger spaces very distinctly he treated with a solution of alum and carbonic-acid water and mounted in glycerin.

The appearance which I call "feathery" he ascribes to interfibrillary spaces and can be best seen by CO₂ injection. Pommer calls them granular and "krümelig" streaks. He refers to canaliculi opening into these spaces and into the clefts between fibers (or bone lamellæ).

My specimens were hardened either in formalin or alcohol; many were examined fresh. I prefer not to harden the specimen because of interference with protoplasm which may be present. In my technic I used hematoxylin a great deal in order to follow changes in calcification or decalcification; at the same time it was most useful in staining the nucleus and mucus. Counterstaining with eosin was sometimes used where the cell protoplasm or osteoid tissue needed special study.

Osmic acid was found useful in studying the canaliculi and was used, as a rule, where evidences of bone softening were evident by gross examination. Scharlach R. was used in looking for fat. Carmin, depended on in the main by Von Recklinghausen, was not commonly used by me. I found hematoxylin quite as serviceable in the study of the nucleus and most useful in the study of bone salts. Acid fuchsin was used as was

cosin in many of my decalcified and microtome cut specimens, but there was nothing to be gained by it over eosin.

Salt solution gave better results as the mounting fluid for unstained specimens and where the air injection of canaliculi or Sharpey's "fibers" was to be especially studied.

Glycerin was used as a rule, however, for it was more permanent and a better clarifying agent.

Acid (1 per cent. HCl) was added to a specimen, sometimes to insure better injection, CO₂ forming from the contained salts.

The bone cells in young bone can be easily seen as protoplasmic masses with vesicular nuclei and not infrequently protoplasmic prolongations may be traced to the canaliculi. In the flatter, older lacunæ the cells look like connective-tissue cells under pressure anywhere else. In edematous bone the seat of inflammation or edema from heart disease or other cause these cells show best. The canaliculi are seen in their normal ramifications when cut short; when plugged with pigment sometimes wide, with edema sometimes narrow.

The lacunæ are most interesting objects for study, being wide and with many large canaliculi branching from these in young bone; narrow, almost, if not completely, occluded in older bone. Hemorrhage may fill them as well as the canaliculi with pigment, and in some cases red blood-cells have been seen in those nearest the Haversian canals. In case of acute osteomyelitis where lacunar absorption has occurred, numerous enlarged and neighboring coalescing lacunæ give an indented appearance to the bone.

The Virchow's bone territories seen in young bone as a circular or oval line faintly outlined a short distance from the border of the lacuna and resembling the outermost rim of a cartilage cell may sometimes be noted as a granular hematoxylin-stained zone of bone salts. These are best seen in conditions where slight absorption has occurred, as in edema of inflammation or passive congestion.

They may be best demonstrated in periosteal new bone in the young and in inflamed bone.

In rickets the resemblance to cartilage cells is well seen.

These seem to have a special significance in bone absorption, the bone reverting to its primary condition, resolving itself into its original territories, which not infrequently are seen to be occupied by giant cells (osteoclasts).

The borders of the bone about cancelli or Haversian canals should be smooth and regular in fully formed normal bone. In inflammation, atrophy, edema, and tumors there are often seen irregular grooves sometimes containing giant cells (osteoclasts). Virchow's territories, bone cells, and lacunæ are seen at times on the very edge of such bone. In some specimens (of edema and tumors) the Virchow territories overlap slightly in lacunar absorption.

The density of bone is to be noted, whether dense, sclerotic, eburnated bone or in lamellæ of average thickness. It may appear when cut on the flat as feathery or granular bone or in layers or platelets sometimes showing bone lacunæ and their contained cells.

The feathery bone is what Von R. calls "Gitterfasern" can be best understood by examining cortical bone of a case of rickets or in bone saturated with fluid in edema. Here near the periosteum are seen the sharp ends of fibers of connective tissue (in process of ossification) crossing one another, giving the appearance of a feather, the pinna (stem) being the deeper shaded part where the fibers cross one another. This appearance is seen, as a rule, when the bone is cut perfectly horizontally.

Granular bone is irregularly arrayed areas of small calcareous masses about bone lacunæ.

No appearance of feathery bone being evident at the outskirts, there are regularly recurring areas on cross section about the size of a large bone corpuscle, surrounded by coarse granules; these stain with hematoxylin and in abnormal bone sometimes take osmic acid stain. This bone is the rule in osteophytes and new bone found in tendons and healing tissues. This granular bone is seen in longitudinal sections to be made up of irregular rough lamellæ separated by less dense granular bone. It is this kind of bone which shows the bone cells poorly on cross section; but they may be found on careful examination and in

thick sections. Blood pigment may be seen in the form of granules or crystals in cells, lacunæ, canaliculi, on the bone platelets or between the lamellæ of bone. This may be noted in connection with acute inflammation, trauma, or passive hyperemia.

Fat droplets and granules may be seen not only in the Haversian canals, but they may be demonstrated in certain conditions in bone cells and in the fine canaliculi by appropriate stains, such as Scharlach R.

The changes in bone corresponding to those in soft parts are quite evident in some conditions, such as necrosis, hemorrhage, pigmentation, and inflammation. Where cells are involved, even though they be enclosed in lacunæ they may show all the appearances of connective-tissue cells elsewhere. Edema causes swelling or vacuolization of protoplasm and nucleus, and in some instances division of the nucleus. If with such proof of edema we likewise find the bone lamellæ swollen or separated, Virchow's territories marked, the canaliculi enlarged, and the calcareous salts disappearing en masse or in areas, it is merely another way of seeing edema in a tissue. It appears differently in heart, lung, connective tissue, and bone.

It is with the object of interpreting for bone the general and special pathological processes which we have studied so well in all organs and tissues that I have made a routine of examining bone at every autopsy.

Necrosis, hemorrhage, and simple pathological processes may be best studied from surgical pathological material.

In autopsies where there has existed some generalized process for a long time it will be as well marked in the bone as in the soft tissues. Pigmentation of chronic malaria or anthracosis of chronic passive congestion is sometimes even better evidenced in bone than in other tissues, the bone canaliculi and cells, their lacunæ, and even the bone platelets holding the pigment tenaciously.

Where the toxins of an infectious disease have had the opportunity of causing edema and parenchymatous degeneration of liver, kidney, and heart, one may look for similar changes in bone cells.

Naturally, the cells which are compressed in fine old parallel lamellæ of eburnated bone would not be the ones to examine for the evidences of edema of protoplasm or nuclear changes. It is in the younger periosteal layers or in the cancelli of the spongiosa that we expect the evidence of generalized changes. However, in one case of long-continued passive hyperemia in one of the bones of the foot amputated for hammer-toe the pigmentation of cells, canaliculi, and bone platelets was marked in all portions of bone examined.

In a case of transposition of viscera in which the blood-count had indicated extreme anemia and all the organs showed fatty degeneration and pigmentation, the bones, too, showed pigmentation of cells and canaliculi, and staining with Scharlach R. showed fat droplets in some of the lacunæ.

In a number of cases of death from infection or acute intoxications (eclampsia), the kidneys, liver, and heart showing evidence of cloudy swelling—all the tissues being edematous, the heart muscle pale, the nuclei enlarged and irregular—the bone cells were seen more distinctly outlined than usual, the nuclei enlarged and frequently divided. The lacunæ nearest the Haversian canals were enlarged, the canaliculi unusually distinct and larger than usual. In some cases the lamellæ of bone next the periosteum were swollen from edema, and Virchow's bone territories were rendered quite distinct. The granular appearance of cortical bone was lost probably because of the dissolving of calcareous granules in the excess of fluid.

Passive hyperemia may act in bone as it does in soft parts, depending a good deal on how it is produced, the length of time it continues, and the intermittency of it. In the soft parts we may get degenerations, atrophy, pigmentation, or regeneration, according to the action of the cause. In bone we see, as a rule, pigmentation edema and in some cases evidence of a tendency to regeneration in the division of cells and nuclei—this from autopsy material. In a case of sarcoma of the brain, pressing on the frontal bone there was passive hyperemia, constant in character with great edema and considerable pressure as evidenced by the venous hemorrhage from numerous points on denuding the

bone of periosteum. Here the bone bulged and was thinned. The microscopical examination showed the lacunæ enlarged, cells swollen and edematous, many pigmented, as were the canaliculi. Virchow's bone territories stood out distinctly and the lacunæ were enlarged, giving evidence of bone absorption. There were irregular deposits of calcareous granules, the irregularity being due rather to the solution of the calcareous material in islets. There was a diffuse pigmentation of the bone and some granular pigment yellowish-brown in color.

In a case I reported in 1898 (*Johns Hopkins Hospital Bulletin*, No. 86) of osteoplastic carcinosis analogous to those reported by Von Recklinghausen, the new bone formation about the carcinoma metastases may be attributed to the congested condition of the vessels about the cancerous foci. It is a condition of congestive hyperemia.

We thus see as a part of congestion the atrophy, absorption, pigmentation, degeneration, and regeneration in bone corresponding to similar changes in the soft parts in chronic passive congestion.

Clinical experience bears out these facts, and it would be interesting to be able to demonstrate in Bier's congestive hyperemia microscopic evidence of a proliferative power in bone cells under the proper congestive stimulus.

III.

THE BONE FRAGILITY AND EBURNATION OF RACHITIS.*

BY WALLACE BLANCHARD, M. D., CHICAGO.

Eburnation presents entirely different characteristics from ossification. Normal bones of young children are pliable until ossification, while rachitic bones are friable until eburnation. Eburnation may be delayed by disease or insufficient nourishment but with favoring conditions it comes suddenly.

Before eburnation, rachitic bone breaks under the pressure of the osteoclast with a sound that can only be described as crunching. When the force of the osteoclast is applied to rachitic bone that is still bending under the body-weight, it will be found to fracture much more readily than it bends, while bone that is only mildly rachitic under the pressure of the osteoclast takes the long distributed bend of osteokampsis. It is well known that rachitic bone in the yielding and friable stage is frequently so fragile as to fracture with the slightest accident, and occasionally fractures under the body-weight. We have seen 27 cases of fragile rachitic bone, showing from 1 to 32 fractures each. Fragile rachitic bone breaks like a pipe-stem with a transverse cleavage.

No operation or rapid forcible correction should be done on deformed rachitic bone in the yielding and friable stage. With change of environment, raw food, and fresh air, eburnation may be expected in from two weeks to two months, and the unlikely cases may eburnate first.

Eburnated bone in a child of three years may be as firm and hard as adult bone, and when broken in the osteoclast may fracture with as loud a snap. Eburnate deformed bone is no

*Read before the American Orthopedic Association, Chicago, Ill., June 4, 1908.

more amenable to correction by the pressure of iron braces, plaster of Paris, or ordinary hand pressure than is so much cast iron.

The following case has been selected because it illustrates to advantage the friability and subsequent eburnation of rachitic bone.

CASE I, FIG. 1.—Florence R., aged four years, was admitted to the Home for Destitute Crippled Children, with badly deforming knock-knees and anterior bent tibia. She will be seen in the picture to be supporting herself by a chair. The muscles were flabby and the ligaments stretched and relaxed, and her legs were so weak and uncertain that she trembled in fear of falling. This agitation made a blur of the head and the left arm in the picture. Her abdomen was distended and her general condition so bad that preceding operation she was allowed three months for recuperation and eburnation.

The skiagram of Case I, Fig. 2, taken before correction of the deformities, shows that the primary deformity inbends were at the apices of the deformities, in the upper third of the tibial shafts, with secondary inbends distributed throughout the long bones of the legs. There was marked outward torsion of both tibiae and rotation inward of both femora. The normal outbend in each lower femoral shaft will be seen to be practically reversed. The skiagram shows fracture of each tibia two inches below the upper epiphysis. These fractures were without history, and were supposedly spontaneous. Both of these fractures occurred at the point of greatest leverage; that is, the apices of the deformity bends in the tibiae. There were marked prominences at the seats of fracture, caused by the sharp, angular, rachitic inbends of the tibiae and the excess of bone callus that overran the open spaces between the fractured ends. The skiagram also shows the cleavage in each spontaneous fracture to have been exactly and smoothly transverse.

The knock-knees were corrected by redressement after supra-condyloid rapid osteoclasts with a Grattan osteoclast.

The anterior bent tibiae were corrected a month later by fracturing laterally, and opening up triangular spaces by manual force on the posterior aspect of each tibial shaft, thereby lengthening the legs one inch.

Skiagram of Case I, Fig. 3, taken after correction of the deformities of the legs by osteoclasts, shows that the fractures produced by the osteoclast after eburnation united so readily and with



FIG. 1. CASE I.—FLORENCE M. JONES, before treatment.



FIG. 3. CASE I.—Skiagram of Case I, after treatment.



FIG. 4. CASE I.—FLORENCE R., after correction by rapid osteoclasis and showing resulting symmetry of the legs.

so little callus as to leave only very slight traces. This skiagram also illustrates quite clearly that in eburnated bone the callus is only sufficient to give a rapid and firm union, while in spontaneous fractures of friable rachitic bone the callus is excessive. This excessive callus of rachitic fractures is usually lacking in firmness and frequently causes delayed union.

Fig. 4 shows Case I, Florence R., after correction of the deformities of the legs by rapid osteoclasis. She stands reliably



FIG. 2, CASE I.—Skiagram of Case I, Florence R., before correction.

on strong and symmetric legs. The confident poise of the body and the reliant expression of the face offers a remarkable contrast to the same child before operation.

We have seen several cases of the spontaneous correction of very slight bow-leg in children that were in vigorous health. We have also seen three cases of very mild bow-leg in children that may have been slightly rachitic, but with no apparent symptoms of rickets, that were autocorrected while they were confined to

the bed by ordinary children's diseases. These are a class of cases which the orthopedic surgeon seldom sees and on which is founded the popular belief that bow-leg and knock-knee are self-correcting.

It is not unusual to see pronounced rachitic bow-leg and knock-knee grow steadily worse in children who are confined to the bed. Badly deforming bow-leg, knock-knee, and anterior bent tibiæ are frequently seen in children who have never walked.

The bed treatment of bow-leg is exceedingly uncertain as well as ill-advised. The best way to correct mild bow-legs in an apparently healthy or only slightly rachitic child of two years is to put the legs into plaster of Paris and hold with mild manual pressure in a corrected position until the plaster sets. Perfect correction will most surely result from the child's walking a month or two in plaster. We have corrected about forty cases by this method.

CASE II.—Kate C., aged five years, as shown in Fig. 5 presents a distinct type of unilateral knock-knee. The primary deformity was an inbend of the upper tibial shaft of the right leg with secondary but very decided outbend of the right femur. The adduction deformity of the right thigh was pronounced and she stood with the left leg very much abducted and the pelvis tilted. Anterior bent tibiæ complicated the case. The knock-knee was corrected by supracondyloid osteoclasia with marked redressement sufficient to neutralize the inbend of the tibial shaft. The anterior bent tibiæ were corrected by osteoclasia at the apices of the deformities.

The skiagram of Case II, Fig. 6, taken after the relief of the deformity by osteoclasia shows that the redressement of the right femur has left it with an abnormal outbend as compared with the left femur. It will be seen that the redressement of the right femur has neutralized the deformity inbend of the right tibia. The bones were eburnated and though the supracondyloid fracture was complete and considerable space was opened up by the redressement, at the seat of fracture no trace of the fracture is shown in the skiagram.

Case II, Kate C., is shown in Fig. 7, after correction of the deformities of the legs. The redressment of the right femur has neutralized the deformity inbend of the right tibia and the two



FIG. 5, CASE II.—Kate C., unilateral knock-knees and anterior bent tibiae.

FIG. 6, CASE II.—Skiagram of Case II after correction.

FIG. 7, CASE II.—Kate C., after correction by rapid osteoclasis and showing resulting symmetry of the legs.

abnormal bends have assimilated into the general contour, producing a straight leg.

The normal relations and symmetry have been restored to both legs. The anterior bent tibiæ and their correction by osteoclasia was only an incident in the case.

CASE III.—Frank C., aged five years, is shown in Fig. 8 to have had an ordinary case of bow-leg except that the bow-leg was more pronounced on the right side, which tilted the body in that direction. It also threw the weight on the right leg and caused him to walk with a limp. The apices of the deformity outbends were midway in the tibial shafts with mild secondary outbends distributed throughout all the long bones of the legs. The tibiæ were fractured by rapid osteoclasia at the apices of the deformities.

The skiagram of Case III, Fig. 9, taken after correction of the bow-legs shows infraction of both tibiæ with acutely defined angles at the infraction points and over-correction sufficient to neutralize the outbends of the femora as well as the tibiæ. A dark shadow marks the density of bent and impacted bone that formed at the seat of overcorrection in each tibia, adjacent to the pressure bar of the osteoclast, while on the opposite side is seen a depression that marks the partial fracture with tearing and separation of the periosteum. Each of the fibulæ took an osteokampsis an inch above the overcorrection in the tibia. The skiagram also shows that though neutralized, the more pronounced outbend of the right femur still remains.

Fig. 10 of Case III, Frank C., shows that the overcorrection at the apices of the deformities has neutralized the other outbends and has assimilated into the general contour, producing symmetric legs. The inward torsion of the tibiæ which caused this boy to toe in, was overcome by forcible rotation out at the seat of the fracture, so as to put the feet in a position of extreme outward rotation when the plaster of Paris had set. This is a very necessary precaution. In one case a secondary operation following a correction of bow-leg was necessary to correct the extreme rotation inward of the foot. The relief of the bow-leg has corrected both the tilt of the body and the limp to the right.

These illustrated cases show that in the most distorted rachitic deformities of the legs, normal anatomical outlines with the best functional results can be obtained by rapid osteoclasia.

The etiology of the following interesting case is still in question. A boy of five years came to the Home for Destitute Crippled



FIG. 8, CASE III.—Frank C., how legs with the body tilted to the right.

FIG. 9, CASE III.—Skiagram of Case III, after correction.

FIG. 10, CASE III.—Frank C., showing that the overcorrection at the one point has neutralized the other outbends and has assimilated into the general contour, producing symmetric legs and correcting the tilt of the body to the right.

Children with rachitic bow-legs of very pronounced type. The deformity was corrected by rapid osteoclasia at the apices of the outbends in the upper tibial shafts. He walked on straight legs for several weeks, when he was discharged cured. Just one year later we were astonished to see the same boy come back with knock-knees of just as pronounced a type as had been the bow-legs of the year before. The knock-knee was corrected by supracondyloid osteoclasia and the boy once more walked on straight legs. After a few weeks he was again discharged cured.

The frequent occurrence of the rachitic type should be borne in mind when considering the subjects of coxa vara and coxa valga. It has been observed that almost invariably when rachitic coxa vara is present it is associated with bow-legs or bow-legs complicated with knock-knees. When rachitic coxa valga is present it is usually associated with knock-knees only. The out-bent femur and tibia, together with the straddled gait of the bow-legged subject greatly increase the weight-bearing leverage on the femoral neck, conducing to coxa vara.

In knock-knee the neck of the femur frequently impinges on the lower part of the rim of the acetabulum, creating a leverage that tends to produce coxa valga.

Two cases have been observed in which a coxa valga occurred on the side opposite to an unilateral knock-knee deformity. In both these cases the patient stood with the unaffected leg abducted. The undue and constant leverage on the femoral neck resulted in a coxa valga on the side opposite to the knock-knee deformity. In both of these cases the coxa valga was not apparent until after the correction of the knock-knee deformity.

CONCLUSIONS.

Normal bone ossifies slowly. Normal unossified bone bends under the pressure of the osteoclast.

Rachitic bone may remain friable indefinitely, but with favoring conditions eburnates suddenly.

Eburnated bone breaks hard and is not amenable to any pressure of iron braces or plaster of Paris.

Very mild bow-leg that is not at all or only slightly rachitic, may be autocorrected.

Rachitic bow-leg, knock-knee, or anterior bent tibia are never autocorrecting and frequently grow worse in bed.

Badly deforming rachitic knock-knee and bow-leg are occasionally seen in children that have never walked.

Rachitic bow-leg predisposes to rachitic coxa vara.

Rachitic knock-knee predisposes to rachitic coxa valga.

Knock-knee is a distributed distortion of all the long bones of the legs, having its usual inception in an inbend of the upper tibial shaft. Bow-leg is a distributed distortion of all the long bones of the leg, having its usual inception in an outbend of the femoral shaft, though as the deformity progresses, the secondary outbend of the tibia frequently becomes the most pronounced.

The skiagraphic observation of a large number of cases would seem to prove quite conclusively that these deformities closely follow fixed lines of development.

Rapid osteoclasis is the safest and quickest means of correcting most of the rachitic deformities of the legs.

The term rapid osteoclasis is used because osteoclasis that is not rapid is always a failure and brings the osteoclast into disrepute.

These conclusions are drawn from nearly 1000 cases of knock-knees, bow-legs, and anterior bent tibiæ corrected by rapid osteoclasis with the Grattan osteoclast.

IV.

MYOSITIS OSSIFICANS.*

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It is likely to be a long time before the medical profession will be in a position to offer the sufferer from myositis ossificans any material aid. The most that we can do at the present time is to make sure we recognize the signs of this malady and take advantage of every opportunity to study it. This paper has been written in an attempt to bring together the more important clinical and pathological data concerning this disease.

There are two recognized types of this affection: one, which is dependent upon trauma and is fairly amenable to treatment, is known as traumatic myositis ossificans; the other is an idiopathic variety, known as progressive myositis ossificans. The former has recently been thoroughly reviewed by Jones and Morgan(1), Péhu and Horand(2) discussed the progressive type exhaustively two years ago. It will be most convenient to consider the two varieties separately, particularly as they seem to have no etiologic factors in common.

PROGRESSIVE, DIFFUSE MYOSITIS OSSIFICANS.

Progressive, diffuse myositis ossifications was the term applied to this disease by Munchmeyer in 1869, and though others had described the condition before, viz., Frecke in 1740, in the Philosophical Transactions, and later Henry in 1759, Rogers in 1832, Testelin and Daubressi in 1844, Hawkins, Wilkinson, and Abernethy still later, yet no one of these writers had done more than to cite cases. Not much has been added to the description which Munchmeyer originally give.

* Read before the American Orthopedic Association, in Chicago, June, 1908.

Etiology.—The earliest signs of ossification which have been reported occurred at four days, three months, and eight months, the latter in a case reported by Wilkinson(4). Horand(5) reports a patient in whom evidence of the osseous character of the muscular swellings was to be had when the child was three months of age. The great majority of lesions in the progressive type are first noted between the second and fifth or sixth years. This fact in itself is suggestive of a congenital origin. Heredity does not seem to figure significantly in the history of any of the reported cases which I have been able to investigate. Males are much the more frequent subjects of this affection, and in all the series reported the proportion of male to female cases is about as three to one (three to two, Räger). Associated with the manifestations of this disease have been a number of instances of congenital deformity. One of Horand's cases(5) had a congenital hallux valgus and microdactylia. Nové-Jusserand(6) also cites an instance of congenital hallux valgus in a patient with progressive myositis ossificans. It is impossible to judge in some cases whether the deformities cited as congenital were not caused by the ossification of the muscles concerned in the motion of the deformed parts and not independent of disease. However, there seem to be enough indubitable instances of associated congenital deformity to add color to the hypothesis of such an origin for the progressive type of myositis ossificans. In the case reported by the writer the patient has always had a torticollis, and he thinks that "stiff neck" has been a characteristic of his family for many generations. Virchow(7) has expressed the belief that certain individuals possess a congenital predisposition toward ossification. In 1897, Pincas advanced the theory that traumatism during birth was the cause of progressive myositis ossificans, just as in the primarily adult cases a definite injury is causally related to the development of symptoms.

The majority of cases have been reported from England, Germany, and Italy, a few from America, and least of all from France. In this fact, however, there seems to be no etiologic significance, though some writers, notably Nové-Jusserand(6),

have directed attention to this fact. In Péhu and Horand's cases(2) twenty-two were reported from Germany, the same number from England, four from America, five from France, and nine others at large. Neither traumatism nor illness seems to be causally related to this type of myositis.

Studies of the etiology of this disease have been rather unproductive of any satisfactory solution of the problem. Péhu and Horand(2) have grouped the theories presented by those who have devoted the most thought to the solution of the question. The first theory, viz., the traumatic, was suggested by Pincas, who believed in "obstetrical trauma" as a causative agent. Abernethy also was an advocate of this theory and has reported a case which he regards as confirmatory of this opinion. A second theory suggests a lesion or lesions of the central nervous system, the effects being brought about through the so-called "trophic" nerves. This is purely theoretical, and no *facts* have been cited to substantiate it. There are certain analogies between the lesions of progressive myositis ossificans and certain of the lesions of the cord. Nicoladoni is perhaps the most distinguished of the advocates of the trophoneurotic theory. (Progressive muscular atrophy.)

A toxic theory has been invoked in explanation of the symptoms, the source of the toxin being indeterminable. This theory, together with the parasitic, finds but little to substantiate it in fact. Trichinæ occasionally give rise to hard masses in the muscles which have an inflammatory zone about them, and arguing from analogy certain writers have suggested a similar origin for the ossified masses in the muscles of patients suffering from the progressive type of myositis. The difficulty with such a theory is that nothing to suggest an organism of any sort can be found in myositis ossificans.

Mays, who instituted the first pathological observations upon this disease, believed that the osseous masses were in the nature of new growths and formulated the neoplastic theory to explain the pathological phenomena of this condition. Virchow classifies the lesions as somewhere between an inflammation and a neoplasm. Cohnheim suggested that retrograde metamorphosis

of tissues might take place in these cases, resulting in the substitution of bone for highly differentiated types of connective tissue.

At present the most widely accepted theory is that which regards the lesions of the progressive form as manifestations of congenital defects in the organization of the muscles. The two most significant facts in support of this theory are the early appearance of the lesions and their association with other congenital structural defects. (Chronic rheumatism, Krause.)

Pathology.

The gross appearance of the affected muscle is not particularly noteworthy. Irregularly shaped masses of solidified tissue, partially covered with muscle and fascia is a brief statement, but covers the ground with sufficient accuracy. These masses are likely to be most completely ossified at or about the insertion and origin of groups of muscles. They are also found to extend as long, thin plate-like masses of bone up through the central portions of the bellies of muscle. In the early stages of the process section of the affected muscles gives an appearance like that of Gruyère cheese. The tissue is edematous and swollen in this stage, and on examination with a microscope a young, embryonic connective tissue is revealed, which is apparently derived from the interfibrillar connective tissue. In the second stage this interfibrillar connective tissue becomes organized, undergoes a certain amount of retraction and forms a kind of fibrous tissue tumor. Ossification in this mass takes place eccentrically, normal muscular fibers remaining at the center of the mass for a long time. Ossification may take place in the same muscles in several different places, the intervening areas of muscle showing atrophy. From the muscles the tendons and aponeuroses become invaded by embryonal connective-tissue cells and undergo considerable alteration, eventually participating in the ossification. Glandular enlargements are quite conspicuous in the neighborhood of the osseous deposits(8), according to Minkewitsch, who demonstrated them at autopsy upon a case of myositis ossificans.

A study(9) of the metabolism of calcium in myositis ossificans, made upon Case I, reported later, shows a perfectly normal

metabolism, so that as far as one observation is significant, there seems to be no reason to suppose that the disease is one of disturbed general metabolism. Krause cites other urinary and metabolism studies.

Lexer and Cohn, quoted by DeWitt(3), give careful histological studies of the lesions of progressive myositis ossificans, and Spiller has exhaustively written up the pathology of a case reported by Taylor(10).

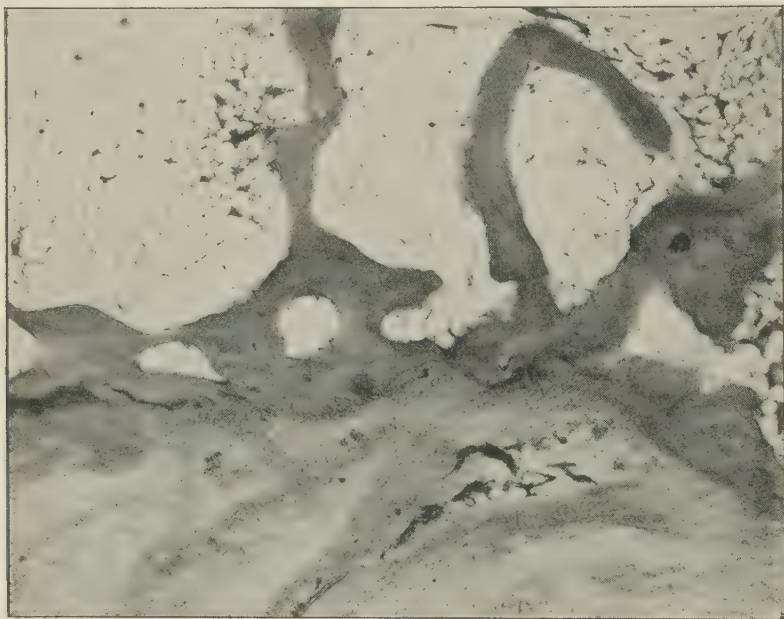


FIG. 1.—CASE I.

Clinical Course.

As has been pointed out elsewhere, the majority of cases of the progressive type can be traced back to their commencement during the early years of infancy or childhood. Very rarely does it appear after the twentieth year. (One case only reported by Hawkins, and this is questionable. Gisner reports one at thirty-four, also questioned by Rope.) The deformities which characterize the development of lesions in the muscles are

oftentimes discovered by chance, so that not always is the development of these ushered in by signs sufficiently marked to attract attention. In adults, however, the involvement of new regions is generally made evident by definite symptoms, such as pain, local heat, and tenderness. The muscles of the neck and vertebral column are usually the first to be involved. The rhomboids, scaleni, erector spinæ, and levator anguli scapulæ, being among the first to become affected.

The muscles are tender to pressure and there is a slight increase in the surface temperature over those involved. There is often an engorgement of the superficial veins and an edematous infiltration of the tissue over them. Glandular enlargements are conspicuous. As the edematous features subside, ossification becomes evident, both upon palpation and when submitted to radiographic study. The electrical reactions of muscle diminish and eventually become wholly obliterated. Nutrition is maintained. The urine is said to show a diminution in the phosphates during the acute stage of the process, but quite contradictory reports are given by various observers in this regard.

The association of congenital defects has already been noted.

In the later stages of the process when extensive ossifications have taken place permanent deformities are common, such as deflections of the spinal column, torticollis, flexions and rotations of the limbs, etc. These are all mechanical in their nature, being caused by the osseous change taking place in those groups of muscles particularly concerned in the motion of the respective joint or joints. Zollinger (11) has reported myositic ossifications in the ocular muscles. The abdominal muscles may show signs of these lesions. The heart and diaphragm are not involved. The viscera are rarely, if ever, concerned. There are no disturbances in the cutaneous sensibility, and the reflexes are scarcely modified. The sexual instinct in the male is somewhat abated and some writers have described an arrest in the development of the external genitals in both males and females. The evolution of these symptoms is very slow, ten to twelve years elapsing before any serious difficulties arise. Among the complications which may develop are the mechanical interferences of the osseous

growths with the vocal cords and with the esophagus and occasionally respiratory difficulty. Ankylosis of the ribs also interferes with aeration of air in the lungs and is probably the main reason for the development of pulmonary tuberculosis in these cases. Myositic patients are frequently sufferers from pulmonary congestions, bronchopneumonia, and phthisis. Among the rarer complications to which reference has been made are epilepsy and urinary incontinence, neither of which is likely to be related in any way to the disease itself.

Differential Diagnosis.

There are a number of conditions which may at times be more or less confusing. Michelson, in describing a case of progressive myositis ossificans, refers to the difficulties of this sort which had arisen in connection with his patient. The case had been observed by several other men, and diagnosis of medullary disease, anemia, and tuberculosis had been made before the correct interpretation was given to the clinical phenomena. San Felice reports the case of a patient who apparently had hardened muscular substance, and the condition proved eventually to be *saccharomyces lithogenes*, the lesions being confined to the sweat glands in the skin. Polymyositis hemorrhagica is a rare condition somewhat resembling myositis ossificans. The effects of the presence of trichinæ have been referred to above, and dermatomyositis trichinosis must be borne in mind when one is attempting to reach a diagnosis. Multiple exostoses rarely give rise to clinical signs suggestive of myositis. The type known as exostosis osteogenetic which occurs about the epiphyses is particularly likely to cause confusions.

Sarcomata when occurring in muscle, and particularly when more than one region is involved, may be quite confusing. Multiple myelomata usually show Bence-Jones bodies in the urine. Rheumatism of the cervical spine, which is frequently characterized by rigidity and deformity, though there is rarely anything to suggest muscular calcification, can easily be mistaken for myositis ossificans. In the same way *Mal sous occipitale* might conceivably be mistaken for this condition—in fact, it has been

so mistaken. Pseudohypertrophic paralysis has also been confused with myositis ossificans.

Syphilitic gummata have occasionally occurred so widely distributed and in such situations as to resemble the ossification of muscle. The writer has recently seen a case where considerable doubt existed for a long time as to the nature of hard masses which were to be felt in the region of the scapulæ and clavicle, accompanied by fixation of the scapulæ and rigidity of the cervical spine. These symptoms had existed for many years in varying degrees of severity. The patient had no knowledge of having had syphilis. Operation had been advised upon a swelling over the clavicle on the supposition that this was caused by a gravity abscess from disease of the atlas or axis. Under a liberal administration of the iodid of potash the symptoms have materially abated. This therapeutic sign, to be sure, is the only one which is at all significant in this case, but it seemed worth citing in this connection when others have reported positive findings of a differential character from the application of this test.

Treatment.

The attempt to modify in any material manner the progress of these cases has been, up to the present time, unavailing. A few remarkable cures have been reported, but in view of the inefficiency of the same measures in other cases and the uniform failure to permanently arrest the progress of the disease, the conclusion in regard to these few exceptions to the general rule is forced upon us that the disease in question was not a true myositis ossificans. A great many different drugs have been tried, most of them of such a nature as to be, theoretically at least, solvents of calcifications. Some of the later of these, like thiosinamin and hyoscinamin, are thought to be absorbents of connective-tissue growths. Among the acids which have been administered locally by direct injection or internally are acetic, hydrochloric, lactic, picric, and sulphuric. Some of the animal extracts from the ductless glands have been used, notably thyroid preparations. The iodid of potash has been thoroughly tried many times. The results of these therapeutic measures have

been failure in practically every case of the progressive myositis ossificans where the diagnosis has been well established.

Operative measures upon this type are equally futile. In fact, in the case here reported the recurrence of the lesions was quite as rapid, if not more so, than had been the development of the original calcifications.

Prognosis.

A discussion of the treatment of progressive myositis ossificans makes it necessary to devote much time to a consideration of its prognosis. Ten to twelve years represent the average duration of life of these cases after the earliest manifestation of the lesions. Death does not ensue from the activities of the disease itself, but from interference with the functional activities of vital organs. As has been before indicated, intercurrent pulmonary disease has been the most common cause of death.

The most complete review of the literature has been presented in a recent article by Krause(12).

The following case is reported because of the rather unusual opportunity which was offered for studying the lesions clinically and pathologically.

CASE I.—May 9, 1906. Mr. R. H. S. Twenty-five years.

Complaint.—Deformities in neighborhood of joints.

Duration.—Nineteen years.

Cause.—Unknown.

Symptoms.—The patient states that he has always since birth had peculiar feet and that stiff neck is an hereditary trait in his family. Thinks his neck has always been stiff. Gradual stiffening of nearly all joints and a (Fig. 2, 3, 4) gradual appearance of hard, bony masses all over the body.

Examination.—Tall, fairly nourished man, good color; quite marked torticollis.

Under the left arm is a mass (Fig. 5) as large as a good-sized lemon, apparently growing from the lower part of the glenoid cavity, which interferes with movements of the shoulder-joint. Motions at elbow (Fig. 6) much limited during past two years. Arm can be extended to within 50 degrees of straight, and from that position to within 15 degrees of complete flexion. Numerous nodes can be felt. On the fingers of the left hand are several nodes near the joints, and in the left wrist, though motion in

flexion is fairly free, extension is much limited, owing to the presence of nodes growing from both ulna and radius. A similar condition in right wrist. In the right elbow there is flexion to 15 degrees beyond right angle, and extension to within 15 degrees of straight is possible. Free pronation, but little supination. Rotation at right shoulder is possible.



FIG. 2.—CASE I.

Left ankle ankylosed in position of 20 degrees of extension beyond a right angle. Second toe much elongated, with nodes on dorsum and sole growing from the metatarsal (Fig. 7) and also from each of the phalanges of that toe. Distinct nodes on the left tibia, growing from the epiphyseal line, limiting extension at the knee about 45 degrees and allowing flexion of about 70 degrees.

The left hip flexed (Fig. 8) about 40 degrees and adducted 25 degrees with practically no motion, limitation undoubtedly due to osteophytes (six years duration). Right foot in similar condition to left except that both second and third toes are enlarged. Nodes on upper part of right tibia similar to those on left (Fig. 9) and motions in knee similar to those on left. The



FIG. 3.—CASE I.

hamstring tendons, on right side, apparently undergoing ossification from their attachment to the ischium to their inferior insertion. Similar changes can be felt taking place in the quadriceps. There is no thoracic movement, and on both sides of the spine over the last four or five ribs are distinct nodes, and from opposite the sixth to the eighth ribs on the right side of the spine similar masses

may also be palpated. The dorsal and lumbar spine is completely ankylosed. Slight amount of motion in the atlo-axoid articulation, the restriction being caused by the presence of nodes. A calcified mass can also be felt under the right side of the chin.

November 22, 1906.—Urine to be quantitated for calcium and sulphur daily, to determine, if possible, whether calcium is



FIG. 4.—CASE I.

being ingested in excess or not excreted in sufficient quantity. (See A. E. Austin's report, *Jour. Medical Research*, July, 1907, p. 451.)

December 11, 1906.—Operative procedures were undertaken with the object of securing freer motion in the shoulder- and hip-joints. Masses of bone were removed from over the left hip-

joint, and on the operating-table the femur could be quite freely moved. Condition at this visit, however, shows that there has been rather more increase of the process about the operative regions and no improvement has resulted. Patient has had several *x*-rays taken, showing the process very clearly, and at present is undergoing a metabolism experiment in the hope of



FIG. 5. CASE I.

getting some suggestion for an appropriate drug treatment, possibly citric acid. General condition seems as good as ever. Most acutely troublesome growth is beneath the right lower thigh in hamstring tendons. This is tender to pressure and the temperature over it is slightly elevated.

December 28, 1906.—Has been taking two grams of citric acid twice a day for three weeks. To-day the acid was omitted.

A fresh metabolism experiment started with the administration of a food, the calcium contents of which is known, in order to watch the metabolism of calcium in this condition. The two previous metabolism experiments on calcium can be seen by reference to 9.



FIG. 6.—CASE I.

January 12, 1907.—Fifteen minims (1 c.c.) of thiosinamin were injected into the bony enlargement in the right popliteal space.

On January 19, 20, 21, and 22 has fifteen minims of thiosina-

min. In the opinion of the nurse and the resident doctor the mass had softened somewhat. Patient felt very confident of this.

February 12, 1907.—Has been having inoculations at least daily, and sometimes twice a day, all the injections being put into the lowest portion of the tumor in the right thigh just above the popliteal space. This has apparently softened, particularly



FIG. 7. —CASE I.

on the inside, the needle seemingly entering a cavity in the tissue, as though the center had softened, leaving a shell outside.

February 21, 1907.—Is apparently less of the osseous deposit at the back of the popliteal space, the needle now going into a cavity in the part where most of the inoculations have been introduced. There is also a little greater freedom in extension of the leg. Inoculations temporarily omitted on the ground of tenderness at the seat of injection. No constitutional symptoms detected.

February 27, 1907.—No material change in the size of the masses. Leg is more sensitive to motion involving this muscle. General condition about the same.

March 26, 1907. — Tenotomy of the internal and external hamstrings was performed through an open incision. Contracture of knees forcibly corrected, and a few degrees more of extension



FIG. 8.—CASE I.

obtained. The proximal phalanx of the second toe was excised entirely. Measured for caliper splint.

April 7, 1908.—To-day patient was moved into a tent for the sake of the out-of-door life. Condition not materially changed except that the left arm is growing rather stiffer. The power of the hamstrings has gained a little in flexion of the leg, and

patient is able to get on his caliper splints for short periods. General condition has not changed at all.

September 28, 1907.—Patient has spent the summer in out-of-door life, and recently a new series of *x*-rays was taken, which show a gradual extension of the disease to other parts of



FIG. 9.—CASE I.

the body, with an increase of the process in the places already involved.

As no favorable progress seems to have been made, the patient was advised to leave the hospital for the winter with the idea of returning at some future time if any advance should be made in the treatment of these conditions.

CASE II.—May 7, 1908. M. R., thirty-eight years. Laborer.

Diagnosis.—Myositis ossificans of tendo achillis (traumatic).

Operation.—Dissection and excision of calcified tissue.



FIG. 10.—CASE II.

Personal History.—Always been well. Four months ago he fell catching his left foot between two bales of cotton; his body then pitched forward, injuring the tendo achillis. This has been followed by pain when walking. Gradually two hard lumps have developed in tendon (Fig. 10).

Physical Examination.—Well developed and nourished. Acne vulgaris in face. Two to four beers daily. Heart, lungs and abdomen negative. Knee-jerks present and normal. At lower end of left tendo achillis close to insertion of os calcis is a hard movable lump $1\frac{1}{2} \times 1$ inch in size. Two and one-half inches above this is another, $2\frac{1}{2} \times 1\frac{1}{4}$ inches, slightly painful on pressure. Complains of pain extending down around external malleolus. Both anterior arches low, but have caused no discomfort. Left foot is somewhat limited in dorsiflexion and inversion. Hallux valgus on right foot.

May 8, 1908.—Ether. Operation.

Incision six inches long over center of lower part of tendo achillis. Tendon incised and two sections of muscle removed, one about $2\frac{1}{2} \times 1\frac{1}{4}$ inches, and one $1\frac{1}{2} \times 1$ inch. These seemed to have a distinct bony formation in them arranged in striæ. Tendon sutured with s.c.g. Skin with S.W.G. Cigarette drain and two provisional sutures left in.

May 10, 1908.—Drain removed and provisional sutures tied.

May 15, 1908.—Wound healing. Up and around with cane.

May 21, 1908.—Stitches removed. Wound nearly healed. Wet corrosive dressing. Discharged to report at out patient department.

No extended pathological report will be made at this time. The two microphotographs show differences in the development of the new bone (Figs. 10 and 11). The material from which the sections were made was obtained at one of the operations described in Case I and represents a portion of the mass shown in Fig. 6. Contrast this with the section made from material removed from Case II, shown in Fig. 11.

CASE III.—Oct. 16, 1905. Mr. G. D. D., age, fifty-one years. Salesman.

Complaint.—Right heel cord.

Duration.—Five years, acutely nearly three years.

Cause.—Unknown.

Symptoms.—First noticed stiffness in right heel cord (Fig. 11), supposedly rheumatism. Noticed it first when doing an exercise in morning. Nearly three years ago noticed acute pain in walking and swelling in heel cord. This subsided under bandage, etc., but without known cause returned, subsiding under antiphlo-



FIG. II.—CASE III.

gistine. This has occurred several times. Now no trouble unless he walks on it, but it conditions his walking. Never any acute rheumatic joint swellings, but until five or six years ago had much trouble with rheumatism in small of back which followed typhoid and often became quite acute, relieved by sal soda. Began eating two meals a day at that time and has continued this ever since.

Examination.—Right Leg. Marked induration about the tendo achillis from its attachment to the os calcis about six inches up into the calf. The thickening is quite hard, suggesting either very tough fibrous tissue or calcareous deposit. In this area there are several nodes which distinctly suggest calcareous deposit. At junction of upper and middle third of leg on inner side of calf is an old cicatrix with marked depression representing an old inflammatory process which has destroyed the gastrocnemius muscle. Right calf $1\frac{1}{4}$ inches smaller than the left. Movements of the right ankle are free except that dorsal flexion is somewhat limited at a right angle.

November 18, 1905.—Has of late had no symptoms and motions are more free. Dorsal flexion and extension normal. To await acute symptoms before doing anything further.

TRAUMATIC MYOSITIS OSSIFICANS.

The progressive type of this affection seems to be related in no way to the type which has just been described.

Trauma in some form seems to be the essential factor in the excitation of the osseous deformities. The bony deposits are confined to the region subjected to the injury. The most recent article on this subject by Krause and Trappe (13) is confined to a consideration of those cases in the literature which have been caused by one simple violent traumatism. They decline to discuss under the head of traumatic myositis ossificans the numerous cases of "riders" and "dancers" bones, which, though not produced by any one local trauma, are in no essential particular different from the lesions produced by violence. There would seem to be no reason for separating the traumatic cases on any such ground as this. Oft-repeated and slight injuries may cause the same lesions to appear as are produced by single and violent traumatisms. They lay great stress on a single violent injury as the essential factor in the etiology. Jones and Morgan (1)

were attracted to the study of the subject from the frequency with which they found the typical lesions of myositis ossificans occurring after fractures and dislocations, particularly the latter. Krause (13) believes that the regions where the traumatic cases most frequently occur are those parts of the body where the fasciæ and muscles are combining to form a conjoined tendon, as is the case where the *moti* unite to form the *quadriceps femoris*. In my own cases (Cases II and III) the ossification has taken place where the soleus and gastrocnemius are uniting to form the *tendo achillis*. In the collected series of cases of Overmann, Rotschild, Rammstedt, and Vulpius, the *quadriceps*, the *brachialis*, *biceps*, the *gluteus maximus*, the *triceps*, the *digastric*, the *diaphragm*, and the *masseter* are the muscles most often concerned. In the 127 cases which Krause has gathered, forty-three were in the *quadriceps*, thirteen in the *adductors*, sixty-four in the *flexor muscles* of the upper arm, two in the *masseter*, two in *vessel-walls*, and one in the *temporal muscle*. Only two female cases were found by Krause in the literature. The predominance of these lesions in the male being due to their greater liability to traumatism. In Jones and Morgan's statistics, 339 cases are included, and 169 of these could be critically studied. Among these there were thirteen females. The greatest number of cases occurred between the ages of fifteen and forty, the period of life when injuries are of the greatest frequency. Between twenty and twenty-three years, Jones notes the largest number, and this he attributes to the fact that many cases occurred among the German militia, whose term of service corresponds to this time of life. The earliest reported case was at five years, and the oldest at sixty-five.

A majority of the lesions succeeded fairly severe injuries, such as kicks from horses, fracture dislocations, violent blows, etc. On the other hand, not a few of these lesions seem to follow oft-repeated though slight traumatisms, such as the chafing of a tight *shōe*, as in some instances where the ossification was in the *tendo achillis*. The formation of the characteristic lesions requires anywhere from one to three or four months. Several years have been required in other cases, according to the statistics

of Jones and Morgan. The reports of Cahen (14), Krause and Trappe (13), Jones and Morgan represent practically the entire literature to date (1908).

Pathology.

Various theories have been put forth in explanation of the essential lesions of the traumatic form of myositis ossificans. The character of the changes strongly suggests that in some way the periosteum is stimulated to proliferation and in consequence of this osseous masses become formed in the substance of the muscles. It is difficult, however, to see how such a theory can explain the second case here reported, where the most conspicuous bony deposit was in no way connected with any bone or periosteum, and there was no evidence that such had become detached by the trauma and thus remotely placed there to take on its proliferating propensity.

A more reasonable explanation, it would seem to the writer, is that which takes advantage of the theory propounded by Reichert, viz., that all cells having a ground-work or substratum are capable of replacing one another under the influence of traumatism or other determining factor. The condition brought about in the progressive myositis ossificans being a metamorphosis and a proliferation combined. In none of the cases reported upon microscopically has there been any evidence of a pathological change. The writer has observed the formation of bone and cartilage in the scar of an abdominal operation. The patient died something like a month after the operation, and the principal location of these bony masses was about the stitch hole. This had been a "first intention wound." The metaplasia of tissue had apparently in some way been set by the traumatism of the operation. If such a condition can occur after a clean incision and the slight traumatism of an operation, why may it not occur in the same manner after violence of other sorts? Schultz and Berthier, the latter through experimental investigations, adhere to the detached periosteum theory, though to the writer the evidence adduced to support it is not conclusive. In a case cited by Jones(1), the pathological report states that "no periosteum was found anywhere in the specimen. * * * The

process was a true ossification, and the type of bone was the cancellated throughout most of the specimen." In some cases, as for example, in the case which Krause(13) reports so fully, there was a cystic formation, the osseous formation having gone on extensively and concentrically about a mass of muscle which was left at the center and which slowly underwent disintegration.

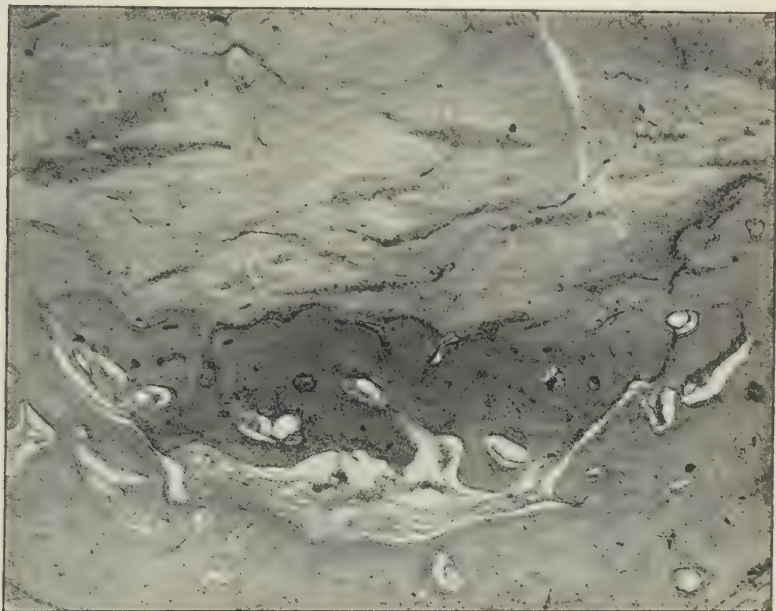


FIG. 12.—CASE I.

In the case studied by the writer (Case II), there was no sign of any periosteum in the specimen, and the process of ossification can be seen fairly well advanced toward trabecular formation in places, whereas nearby there will be seen areas where an apparent osteoid tissue is being laid down.

Symptomatology and Clinical Course.

After severe injuries, such as direct blows, fractures, or dislocations, there may very insidiously form a thickening at the seat of the injury, which generally is not very painful, though

it may be somewhat tender to touch. The tissues about are somewhat swollen, and motion which involves the muscles in that region generally decreases. These signs come on shortly after the injury, and may be at first regarded as only the result of the bruising of the tissues or as an hematoma. In the case of fracture dislocations, it may be regarded simply as an excess of callus formation. In place of showing a tendency to reabsorb, permitting the restoration of function, it progresses if the cause be a myositis ossificans, and the diagnosis should then be made clear by the *x*-ray. Almost always the bony mass is evidently firmly adherent to the muscles in the neighborhood, the skin moving freely over it. In some cases, of course, the larger muscularly imbedded masses may attach to the long bones by an osseous pedicle and thus be wholly immobile.

In the differential diagnosis one has to consider the question of the development of callus after simple fractures, sclerosis of muscles. Hematoma may for a long time cause one to be in doubt as to the exact nature of these tumors. Sarcomata have to be differentiated. They are of rapid growth, have a predisposition for the young, and are almost always caused by a trauma or at least associated with it. In sarcoma, however, there is a progressive tendency to infiltration about the hard tumor, whereas in myositis ossificans the accompanying infiltration slowly recedes. Sarcomata have a predilection for the epiphyses, whereas the myositic growths are more likely diaphyseal.

Chronic inflammatory bone processes and exostoses and osteomata must be excluded. In all these differentiations the *x*-ray is invaluable. Needle puncture may occasionally be helpful.

Treatment.

Where function is not disturbed and inconvenience is not caused, the condition may be left alone. The class of case that this is applicable to is, of course, that in which there is an isolated ossification, as in Case III of this series, where no radical treatment was necessary. Absorption of some of these classifications seems to have occasionally taken place. These were cases where disintegration had gone on with the formation of what seemed

to be an abscess, and when the supposed abscess was opened, was found to contain only the phosphate and carbonate of lime.

Operative removal, which must be very thorough, will be the only effective method of treatment if the process has become at all a crippling one. Manipulations, stretchings, etc., are generally contraindicated and must be undertaken only guardedly, if at all. Three to four weeks' rest of the part should succeed operation. Hydrotherapy, massage, and rest may quiet down the milder cases.

Prognosis.

In contrast to the outlook in the progressive form of myositis, we find that in general it is very good in the traumatic type. In the periosteal type the prognosis after operative measures is not quite so good. Periarthritis, periphlebitis, and thrombosis were the most serious complicating conditions noted. Delorme observed some vasomotor disturbances and Köster reported a gangrene of the foot and lower leg from interference with the circulation. In the 177 cases studied by Krause there were only two important disturbances of function after the condition had been arrested.

The bibliography of Strauss(15) is not included here, because the traumatic and progressive cases were mixed in together. Krause's bibliography includes all the continental literature, but makes little note of British or American references.

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V.

NOTES ON THE PATHOLOGICAL ANATOMY OF CONGENITAL HIP DISLOCATION.*

BY W. G. TURNER, M. D., M. R. C. S. (ENG.).

The idea of presenting some notes on the pathological anatomy of congenital hip dislocation is to bring to your attention certain facts which greatly influence the treatment and prognosis in certain cases and in order that the reduction of the condition may not be viewed from the point of traumatic luxation alone.

Before the so-called "bloodless reduction" came into vogue in select cases, in many of the great clinics the "open reduction" was practised following the Hoffa-Lorenz operation.

Historical Note.

The condition of congenital dislocation was recognized from very early times. Hippocrates mentions it. Ambrose Paré, in 1678 described the symptomatology. Verduc, of Paris, in 1701 reduced congenital dislocation by traction, but found that recurrence always was a sequel shortly after traction was abandoned. Thus the attempts continued with slight improvement of results by the open reduction method, until 1895, when Lorenz presented his method of reduction and retention. Many other surgeons practised in the early times the traction method—Dupuytren, Malgaigne, Pravaz, Paci, and many others. The proper fixation of the head of the femur after reduction in the acetabulum and a rational method of reductions were the crucial points.

After the first work of Lorenz the extreme abduction or rectangular position was adopted. This, with certain modifications, is now generally practised. However, many relapses were

*Read before the American Orthopedic Association in Chicago, June, 1908.

reported and the percentage of anatomically perfect results was relatively small, anterior reposition and relapses being frequent. This leads me to examine and review many of the causes of these failures.

Classification of Types.

From observation of cases and not taking into account the secondary differences in very adult cases, Lorenz and Reiner give three main varieties of this condition.

1. This case, *in utero*, marked flexion of the legs being present, the head of the femur is below and behind the cavity of the acetabulum. At delivery and with extension of the legs the head of the femur becomes superior and posterior immediately, thus a superior and posterior position, secondary to an inferior and posterior.

2. *In utero*, the head of the femur lies below and slightly behind the acetabulum, but on delivery comes to rest, owing to laxness of capsule or probably some deficiency in the bony skeleton, not in the axis of the acetabulum, but against the superior lip of the same (*vide* Fig. 1, healthy side).

3. Primary, supracotyloid dislocation. The head of the femur is felt in position according to the anatomical condition of the neck of the femur, deformed or normal. Thus either a subspinous in anteverted femoral neck (as in Case IV), or directly above the acetabulum as in Case II.

Clinically, a good working classification is as follows:

- I. Anterior or subspinous,
- II. Supracotyloid,
- III. Posterior or iliac,
- IV. A form presenting a combination of I, and II, or I and III, according to the position of the femur in flexion or extension.

Anatomically, we find that there are three separate bones combining to form the os innominatum. These three all converge in the Y cartilage of the acetabulum. Here some primary differences are found in cases of congenital dislocation. Heusmer and Saintons have described cases of newly born, and the former a six months, fetus. In these were found a slight deficiency of the upper rim and marked diminution in the size of the

acetabulum as compared with the other side. Other observers have confirmed the fact, and that on the pathological side the cavity is made still more shallow by fibrous tissue and fat deposit. I myself well remember a case I saw in a Paris clinic of a newborn child in which there was a marked posterior or iliac dislocation. In this case there was a deficiency in the rim in its posterior and upper segment.

The condition of the acetabulum has been frequently confirmed, in fact Hoffa reports that in every case which he treated by the open method he found a definite cavity, always big enough to receive the tip of his index-finger. Here, then, we have a primary very important point, a shallow acetabulum and in some cases, before and at birth, a slight deficiency of the rim of the acetabulum in its upper and posterior parts. This may be very slight, as seen in the sound side of Case I. Besides this the shallowness of the cavity is not regular, but rather triangular in shape, base downward, the upper half being more affected than the lower. Also a ridge gradually forms running vertically from the tip of the ilium downward to the posterior border of the acetabulum. A specimen in Joachimsthal's clinic shows this very well.

In the progressive cases this factor must be remembered. Some very good specimens, which may be studied in the Dupuytren Musée, Paris, and in the Berlin and Vienna collections quite confirm this.

Naturally, further changes are produced in older patients, especially when body weight becomes a factor. Where the head rests a new depression is found (Cases III, IV, V and VI). Where the head of the femur finds no fixed place to play in, there may be a slipping around of the head and still another depression formed. The Dupuytren Museum has a specimen where three such new cavities are present, one above the other. Nelaton also describes a specimen in which the head of the femur worked freely according to posture in two such cavities, but a persistent new joint is not common as the opportunity for the same is not favorable (Ludloff). The anterior or the subspinous position is the form presenting the most favorable chances as is seen in specimens 4 and 5. This is due to the fact that the femoral head

is firmly held and prevented from upridding by its subspinous position and the Y ligament of Bigelow.

In the head of the femur there are many different forms presented. Of clinical and practical interest the most important, apart from the closely allied to normal form, is the so-called "anteverted head." This Lange claims to be due to a torsion of the femur; others, however, say that it is due to a bending forward of the head, the torsion being a very slight factor. Clinically, to recognize this form is very important, as, if treated in the ordinary method of first and second flexion, an anterior reposition is sure to result (Case III).

Another form of the femoral head is the "mushroom form," not very uncommon. More uncommon is the "knob-shaped head" (as in Fig. 4), or the "upturned one" (as in Case II).

The important factor as regards fixation is to remember the axis of the neck and head of the femur, and retain the same in that point of your acetabulum. In the pelvis, in general, unilateral luxation causes a deformed cavity as seen in specimen. This is the most important change. The capsule becomes thickened and varies in form. In the anterior position the Bigelow Y ligament plays a very important rôle; the head is held and prevented from slipping further upward by this important band.

In the secondary posterior variety the capsule assumes an hour-glass form, and becomes twisted on itself, due to the new position of the head. The muscle changes are due to the altered relationship between the origin and insertions; thus we have in general the distance between the ilium and trochanter shortened. On the other hand, the distance between the os pubis and femur is lengthened. The diagram explains this far more clearly.

Here mention must be made of the Trendelenburg symptom. As is known, this consists as follows: The patient, standing with his back to the observer, flexes his thigh first on one side, then on the other. If there is any factor causing loss of tone in the pelvi-trochanteric muscles of one side, whether due to alteration in length or to some lesion, and which at the same time permits weight-bearing, the side of the pelvis opposite to the lesion drops

when the thigh of the same side is flexed. Whereas, on testing the other side, in contradistinction, it rises. This is readily explained by the diagram of the principle of the lever. The symptom is of distinct value in cases of congenital luxation, coxa vara, and coxitis.

Functionally, a very important rôle is played by the ileopsoas muscle. In the posterior variety this muscle and its tendon practically act as a sling to the pelvis and prevent further up-riding of the head on the dorsum of the ilium (Lange). Naturally,

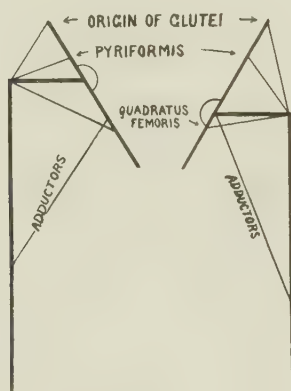


Chart showing altered muscle relations due to upward displacement of femur.

on the affected side there is marked diminution in the tone and power of the muscles. This is very well demonstrated clinically by the Trendelenburg test. In the Class 1 of Lorenz's classification, where on erect posture there is an anterior position, but when much weight is thrown on the limb or flexion is present it assumes the dorsal or iliac position; here we usually find the neck is twisted and the head is in the anteverted position with the epiphysis eccentric from the line of the normal shaft neck angle.

What is to be done? Naturally, the reduction is the first treatment, and the original first position, as laid down by Lorenz, practised. This allows for contracture also of the posterior and inferior capsule and periarticular support (muscles, etc.). Slightly also is the superior capsule shortened. The head now, though

replaced, also assumes a partial anterior reposition owing to the deformity present. If the operator feels that he can replace the head and fix it in that position, at the same time bringing the femur down to a position of 45 degrees abduction, well and good. Should, however, this not be obtainable, it is wise to fix the same for a month or six weeks in extreme axillary abduction, as advised by Werndorff. This assures the position of the head in the acetabulum, and also assists in the contracture of the superior and anterior periarticular support. The choice must be made between this position and the position of internal rotation with 45 degrees abduction. Then the next fixation must be carried out with the femur sufficiently internally rotated to replace the head, and at the same time in 45 degrees abduction of the shaft, in order to assure the concentric position of the femoral head in the acetabulum.

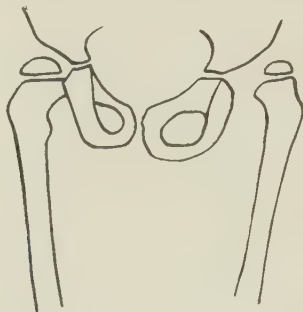
The question of weight-bearing depends entirely on whether the operator feels confident enough of his fixation to allow it. Personally, I do not agree to it, except in very selected cases. Naturally, in all fixations, the same must not be carried out for too long—to allow contractures to fix the limb in a pathological condition.

From my own practice and from the clinic at the Royal Victoria Hospital I have selected examples of these varying conditions.

CASE I.—This presents a combination of two types mentioned. In the first place, on the apparently sound side, we see a distinct defect in the contour of the upper rim of the acetabulum. This is seen in most cases of so-called subluxation. Besides this, the epiphysis is set on the neck in an eccentric position; thus, on weight-bearing the head does not lie in the axis of the cavity, but on the upper and outer lip which, combined with the deficiency above noted and the laxness of the ligament—as shown by the position of the head—readily explains some of those cases which gradually develop as the weight-bearing increases. These cases are not uncommon, and for a time observers, especially in Paris, held that this was always the primary condition—that it was not congenital, but progressive. This is certainly not so, however, in all cases, as is proved in Case II.

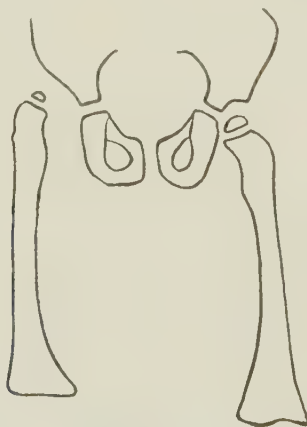
CASE II.—This case is of interest as the luxation was present

before any weight-bearing to my certain knowledge. The influence of heredity presents a predisposition in this case, the mother had a so-called double-jointed condition of shoulder and



CASE I.—Note dislocation on left side—complete—anteverted upturned head.
Subluxation on right side.

hip, besides very marked hyperextension of fingers and hands. Here we find almost rudimentary acetabulum; there is a very deficient upper lip, and the head of the femur is best seen in the diagram directly above the cavity of the joint. There is a

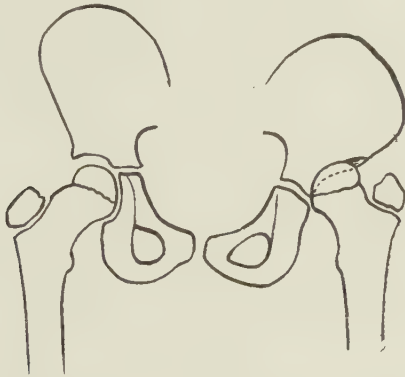


CASE II.—Note rudimentary acetabulum—supracotyloid dislocation—superior rim of cavity so deficient that axillary fixation was indicated—almost no shaft-neck angle.

marked deficiency of development in the head of the bone. Almost a total absence of shaft and neck angle may be observed; besides the epiphysis is perched almost on top of the bone. This

plainly demonstrates the impossibility of the second fixation being made in the same position as in Case I. This head must be held in the acetabulum until the upper lip develops and the ligamentous structures around the joint have contracted sufficiently to hold the same in place. Naturally, as I observed before, the fixation must not be continued until contractures fix the limb in a pathological condition.

In this case also the radiogram might be misleading, as by it there appears to be a very shallow cavity of the acetabulum, but we must remember that the limb remains completely cartilaginous until the third or fourth year (Ludloff). In this very case on reducing here was found to be a sufficient cartilaginous



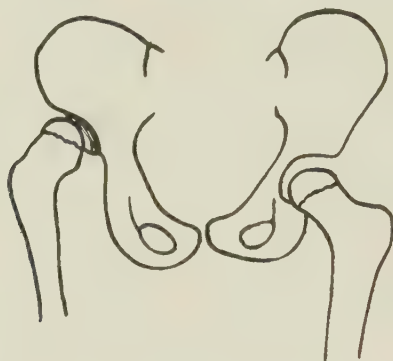
CASE III.—Example of fixation with non-attention to condition of anteverted head present—note new subspinous acetabulum.

posterior lip to retain the head in the cavity until a position of about 45 degrees abduction was reached. It then slipped out. How different does this appear from the radiograph probability?

CASE III presents an example of nonattention to the anatomical condition of the head when anteversion is present. In this case you can again see the slight eccentric position of the epiphysis on the well side. On the pathological side can be seen the tracing of the new acetabulum subspinous in position. Clinically the head is readily felt there; functionally, the case shows about one inch shortening, some eversion of the foot, and from the present bony purchase there will be no augmentation of deformity from weight-bearing. But it is a clear example of not paying attention to the anatomical condition at the time of second and third fixation. The head was a distinctly anteverted one reduced in 1903 by Lorenz. The parents then neglected further

advice—keeping the cast on for one year, and then allowing child to walk as she could.

CASE IV.—Patient aged twelve; walks with eversion and one inch shortening. This case presents a well-marked acetabulum



CASE IV.—Note well marked subspinous acetabulum and constant joint relation.

which has been produced subspinous. This case illustrates very well the contention of Ludloff that this variety alone presents conditions favorable to a stationary joint in a new position. The

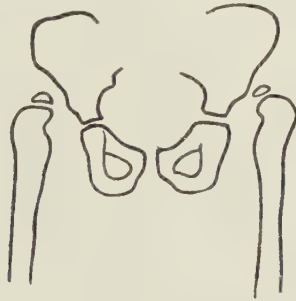


CASE V.—Antithesis of No. 4 Rudimentary Acetabulum. Note flattening of pelvis due to constant weight bearing.

head of the bone is well held against the ilium by the Y ligament of Bigelow. Clinically, there was absolutely no upridding and a firm new joint was established.

CASE V.—Patient aged twenty-six. This case presents an

antithesis to the previous, a very movable condition of the head of the femur. There is still present a rudimentary acetabulum, but weight-bearing shoves the head well up toward the crest of the ilium posteriorly. The patient, as in all these cases, at times relieves some of the weight by pressing his hand firmly over the right buttock. From the extent of the upridding it would seem probable that the iliopsoas bears up a suspending action. With regard to the pelvis it is interesting to note that on the healthy side there is gradually developed a flattening due to constant weight-bearing on that side. This naturally in the case of the female patient would be of very great importance as tending to cause rotation of the fetal head during parturition. Otherwise the pelvis presents the usual somewhat slightly arrested development on the affected side.

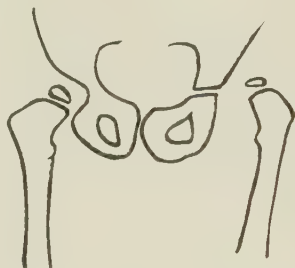


CASE VI.—Typical bilateral dislocation supracotyloid.

CASE VI.—This case presents a typical bilateral dislocation. Here there is a slight difference on the two sides, the acetabulum being much better formed on the left than on the right side. The condition was one of typical supracotyloid dislocation, readily reduced, but at the same time showing the rim of the acetabulum to be sufficiently developed that the head might be retained in position until 60 degrees abduction was obtained, it then slipped out. On the right side, however, this rim was very poorly developed, the head dislocating backward when about 40 degrees abduction was obtained. On being reduced, the head of the femur slipped into the acetabulum instead of slipping over a definitely formed rim. Clinically, the patient presented the usual classical symptoms.

CASE VII.—This case was a unilateral, left-sided, congenital dislocation, aged eighteen months. The child had not walked.

In this case the contour of the trochanters is quite bluntly shown. The shaft-neck angle is preserved; however, on the side of the dislocation, the radiogram presents almost no acetabulum. Clinically, this was not entirely confirmed. However, the acetabulum was very deficient superiorly, the head was separated by a rim on testing, but it slipped progressively backward when adduction was practised as though there was practically no



CASE VII.—Note rudimentary acetabulum—Relaxation very readily obtained.

obstruction between the acetabulum and posterior dislocation. This was proved clinically by the readiness with which the posterior dislocation was brought about. In a case such as this extreme rectangular abduction would be indicated as the first position.

CONCLUSIONS.

1. The condition is usually intrauterine in occurrence, relatively seldom resulting from difficult delivery.
2. Some few cases may develop progressively, where there is some deficiency of the upper lip of the acetabulum, combined with relaxed ligaments and loss of tone in the surrounding muscles.
3. Before attempting reduction, the shape and axis of the head of the femur should be ascertained, also condition of acetabulum.
4. In young cases the radiogram may be misleading owing to the predominance of cartilage in the formation of the articulation.
5. Reduction may be carried out either over the posterior rim of the acetabulum or the inferior, according to the experience of the operator.

6. After reduction the "range of retention" in the joint should be ascertained by redislocating and fixation adopted in the position most removed from the recurring point.

7. Malposition, especially that resulting from anteverted head, should be carefully guarded against.

8. Between fixations it is wise to control the position of the head by means of the radiogram.

9. In older cases, after six years of age, the possibility of contractures in a faulty position must be guarded against. Therefore the fixation must not be of too long duration—6 weeks to 2 months.

10. While weight-bearing may stimulate the development of the femoral head and acetabulum, it is not essential and quite contraindicated in a percentage of cases.

11. Owing to muscle changes the convalescent treatment of massage and exercises should be carefully followed until the disappearance of the Trendelenburg symptom.

12. Myorrhexis of the muscles is only occasionally essential.

VI.

THE PAINFUL FEET OF RAYNAUD'S DISEASE.

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PHILADELPHIA, PA.

Orthopedic surgeons are frequently confronted with problems involved in conditions giving rise to painful feet, and it is, therefore, appropriate to consider one of them in Raynaud's disease. This serious malady was first described by Sir. Benjamin Brodie in 1837 and later by Maurice Raynaud in 1862, 1872, and 1874. It is not our purpose to describe in detail the pathological conditions about which so little is known, but to confine our attention to the disease affecting the lower extremities, especially the feet.

Much has been added to the literature in the past few years, but the views as to the etiology and pathology remain practically unaltered. The term disease, as applied to this affection, is no doubt erroneous, and, as Guilleau and Thaon declare, it is not a pathological entity, but a syndrome created by very different causes. Several writers speak of it as Raynaud's phenomena (Hutchinson).

The clinical tripod of Raynaud, as described by him, is local syncope (called regional ischemia by Weiss) local asphyxia (regional cyanosis or regional hyperemia) and local gangrene. Raynaud believed symmetry of the lesions and absence of demonstrable changes in the vessels to be two essential features in the disease. Strauss says it rarely partakes of the symmetrical type, but is only bilateral. The latter statement is substantiated after a review of a number of cases by the authors and is well illustrated in the case here reported. Several writers express the opinion that tissue changes are not confined to the soft parts but may affect the bone as well. It seems more probable that

any changes in the bones occurring in a patient affected with Raynaud's disease would be caused by a coexisting or independent disease.

Strauss reports a case in which the *x*-ray showed atrophy of the terminal phalanges. The relation existing between Raynaud's phenomena and rheumatoid arthritis was not seriously considered until Jones' very excellent article appeared citing a number of cases of rheumatoid arthritis which were preceded or followed by local syncope or local asphyxia. Jones says, "Seeing, therefore, that these two diseases show a tendency to periarticular swelling supervening upon vasomotor phenomena, the probability of their being closely related pathologically seems a reasonable hypothesis." Other manifestations, not mentioned by Raynaud, are intermittent hemoglobinuria and onychophagy, the former occurring in about 7 or 8 per cent. of the cases, and the latter, according to Prospeter, is quite characteristic. The very interesting feature of Raynaud's disease is that it affects almost any part of the body, such as the nose, cheeks, ears, lips, upper and lower extremities. It has been noted that the feet are less frequently affected than the hands. Its occurrence, as is well-known, is more frequent in females between the ages of twenty-eight and thirty-five, though congenital as well as senile cases have been reported. Modern clinical medicine claims it to be more common in infancy. This, however, seems to be quite incorrect. Etiologically, we find many factors, the most important of which are exposure to cold, toxic influence, such as lead and arsenic, physical and psychical trauma infectious diseases, such as enteric and typhus fever, influenza, erysipelas, and especially malaria. Syphilis and alcoholism are recorded as causes, and when the affection occurs in young children syphilis can be strongly suspected as being the exciting factor. It is met with in diseases of the central nervous system as tabes, syringomyelia, tumor of the cord, hemiplegia, etc. Not infrequently, it is associated with neurasthenia, chorea, epilepsy, hysteria, and the traumatic neuroses. Cohen and Herz noted it in combination with Graves' disease and migraine. It has frequently occurred with Bright's disease.

Raynaud, in describing the pathological physiology, claims that vascular spasm causes the local syncope, and later relaxation causes local congestion or cyanosis. Much more detail to this theory may be added, but this would not increase our knowledge on the subject. Raynaud did not believe that gangrene resulted from disease of the vessels or nerves, but Pitres and Villon, in 1884, conclude that profound alterations exist in the peripheral nerves, which show a parenchymatous neuritis. Such a variety of conditions has been noted in the findings that we might well state that the pathogenesis is far from uniform, and there exists a large field for future investigation. Accuracy in recording the clinical data and precision in pathological reports will materially aid in obtaining definite knowledge as to the proper grouping of conditions about which there is a vagueness at this time.

Symptoms, Signs, and Course.

The first symptom that the patient complains of, when the feet are involved, is that of pain, not only in the toes, but of a shooting type which seems to pass up the legs often as far as the knees and hips. At first it may be only a numbness and a feeling of needles and pins, but sometimes quite severe and sharp. It is generally bilateral, but it is more or less frequently observed to be unilateral at first. Raynaud says, "I have known persons who were otherwise quiet and patient to howl with pain, their bodies bent and contorted as they sat in bed." This pain grows worse with excessive use, and improves by rest, heat, or warmth. The patient may or may not observe the blanching of the toes or local syncope, but almost invariably becomes alarmed when the redness or blueness appears. It will generally be noted, except in the very advanced cases, that the toes are tender on palpation. Limping is sometimes noticed or at least a loss of spring to the gait. The pain may be present some time before the patient notes any abnormality in the feet. The affection, as previously stated, is always bilateral, but true symmetry is not common. The course is typically intermittent, is always worse in cold weather, improving during the warm weather. Hyperhidrosis is quite characteristic. Irritation by the pressure of shoes and flat-foot plates, cutting of corns, removal of toe-nails

are irritative factors conducive to the advance of the affection. Small vesicles appear containing seropurulent material, or localized areas which, under favorable circumstances, usually dry up. The parts involved may be swollen, and this is especially to be observed in the ankles. The vasomotor symptoms may continue for several minutes and are more frequently noted as lasting less than a day, but cases have been reported in which these symptoms persisted for weeks and even months. Disturbances of sight, paroxysmal hemoglobinuria and albuminuria may be present. Other associated symptoms are scleroderma, cerebral symptoms such as torpor, partial loss of consciousness, mania, etc., and various joint involvements.

The disease may terminate in gangrene of one or more toes, but this rarely occurs if proper precautions are taken. Local syncope may be the only symptom during a very long period of time, or the disease may advance to the stage of asphyxia. Cases are recorded in which death has resulted after gangrene had developed. The sensations are sometimes impaired and the reflexes altered, but the latter is not constant. Intermittent attacks may occur for years without any great disability or discomfort.

The treatment, we believe, will accomplish a great deal if carried on in a methodical and persistent manner. Rest of the affected parts or relief from weight-bearing is quite essential. Frequent applications of heat, the wearing of wool or flannel stockings, mild forms of massage during the exacerbations afford much relief. A number of cases are recorded where Bier's elastic band was used with very good results, especially in relieving pain. Raynaud used, as have many others, the application of the electric current to the spine with favorable results. Others use the nitrites to relieve vascular spasm. Arsenic has been highly recommended. Thyroid medication has been favorably recommended. Waugh administers atropin and hyocyamin in combination. Quinin, adrenalin, cocain have been used to advantage. Operative procedures are strongly contraindicated, Jones believes it important to treat gastric, intestinal, and uterin disorders when coexisting.

M. S., female, aged thirty-four, occupation, trained nurse; suffered the usual diseases of childhood. Had an attack of chorea about the age of thirteen years following a fright. Had enteric fever at the age of nineteen and was ill in bed for twelve weeks. As a sequel of typhoid she developed neuritis of the right leg, which was entirely cured. In 1896, patient had the so-called rheumatic iritis, from which she recovered in a short period. In 1898, developed influenza from which recovery was uninterrupted.

Family History.

Father died of typhoid pneumonia and mother of carcinoma of the breast. One brother living, aged thirty-six years, is said to suffer from heart disease and nervousness as a sequel of sun-stroke some five years ago.

Present Illness.

In 1900, the patient said she suffered frost-bite of the toes of each foot, but there was no breaking down or loss of tissue. There was, however, a stinging or burning pain which has recurred more or less frequently since that time. She did not notice any evidence of blanching of the toes or local syncope. In the spring of 1903, corns were removed from the fourth and fifth toes of each foot. Shortly after, ankles became swollen and feet very painful, so much so that she was unable to follow her vocation. In the summer of 1904, the fourth toe of the left foot became much inflamed and later, "run arounds" developed on three toes of the same foot, and the great toe of the right foot. In November, 1904, the nails of both large toes were removed and at the time there was no congestion noted. About one week ago the toes began to sting more than formerly and bluish discoloration set in. The pain always seemed worse toward the end of the day and at night. Blebs formed on her nose, on both ears, both hands and tips of fingers, on knees and feet. The blebs were usually very painful, but always ultimately "dried up." She frequently had pain shooting up the legs. The condition always showed improvement during the hot weather.

Examination of the patient in November, 1907, was as follows: She was well developed and nourished, appetite good, and bowels regular. Knee- and ankle-jerk quickened, plantar reflex present. Pharyngeal and nasal reflex present; triceps and biceps normal. Pseudoclonus at times. Areas of hyperesthesia in both feet. Chest and lungs showed no abnormality. Heart presented a systolic murmur at the apex with very slight transmission. Radial pulses were asynchronous and the right at times entirely absent.

Urine negative. Eye examination by Dr. C. W. LeFevre: Found a beginning pterygium in the left eye and a low degree of compound hyperopia. Also some sluggishness of the lymph circulation about nerve head. Visual acuity practically normal. No disturbance of muscle balance. Field of vision quite irregular and much diminished.



FIG. 1.—Showing bilateral superficial skin necroses

Feet.

Both slightly swollen about the ankles and felt quite cold to the hand. The third and fourth toes of the right foot were cyanosed, while the great toe and third toes of the left foot were likewise congested. Numerous blebs containing seropurulent material were found on tips of toes and on dorsal and plantar surfaces of each foot, some of them symmetrical, some simply bilateral. Photographs taken show the location of blebs fairly well. Skiagrams by Dr. W. F. Manges revealed no abnormality in the bones of the feet.

Course of Treatment.

The patient was placed in bed and not allowed to bear weight for a period of four weeks. During this time forced feeding and internal administration of iron and arsenic was resorted to. The feet were covered with lamb's wool and bandaged to the knees, while constant application of heat was obtained by hot-water bags. Very light massage was applied daily to the feet and legs. Bier's elastic band was applied daily above the knee sufficiently tight to cause a slight redness, but no pain or discomfort was allowed. At the end of four weeks, orthopedic shoes were ordered



FIG. 2.—Showing bilateral superficial skin necroses and involvement of ends of toes

and the patient allowed to walk. After the fourth day of treatment there was very little pain and the feet seemed to improve. During the four weeks she lost several toe nails and a few blebs ruptured which were rather slow in healing. Aseptic surgical dressings were employed whenever necessary. No incision or curretting was resorted to while the patient was under our observation; when a nail became sufficiently loose, we waited for it to drop off. We did not consider it necessary to administer the electric current along the spine in the manner reported in other cases. After leaving the hospital, the patient at times had attacks of pain and some increase in cyanosis. Toward spring, however, continual improvement was manifest, and at present

writing the condition is practically well. We have advised her to change her occupation for one in which weight-bearing will be less constant and where exposure to cold can be avoided. We have also advised her to spend the winter and spring months in a warmer climate.

Raynaud's symptom-complex presenting itself in the feet is of interest to the orthopedic surgeon. It is of interest to state that the case here reported was seen by three other physicians without recognition of the seriousness of her disability. One of them, however, is said to have treated the condition by cutting "run arounds" and forcibly removing the nails. The patient's occupation of trained nurse, which required much walking also aggravated the condition. At one time, the patient was urged to wear flat-foot plates for the relief of the pain, but fortunately this suggestion was never carried out. On entering the office the patient did not offer to show both feet, but removed the shoe and stocking of the foot that pained her most. For purposes of comparison, and more complete analysis, the patient was requested to uncover the other foot when the bilateral manifestations became apparent. At first we thought that there was a symmetrical presentation, but further study showed this to be an error.

This phenomena might very easily be confused with intermittent claudication, erythromelalgia chilblains, and other forms of pododynia. The diagnosis, however, is not difficult when two or three of the typical lesions are present. The age, sensory, motor trophic disturbances and the bilateral evolution usually enable one to form a correct conclusion.

Intermittent claudication occurs in older people and is less common. Vasomotor symptoms and pain are usually bilateral. Walking becomes extremely painful in a short period (probably a half hour). Rest gives almost immediate relief. This is not the case in Raynaud's disease. Erythromelalgia is characterized by heat, redness, and swelling, most marked on the soles of the feet. This as a rule is not confined to the feet, but may involve the upper part of the legs and upper extremities.

CONCLUSIONS.

1. Raynaud's phenomena is usually bilateral, occasionally unilateral, but is rarely symmetrical.

2. It is more common in females between the ages of twenty-eight and thirty-five. When seen in children syphilis should be suspected.

3. Its relation to rheumatoid arthritis is well worthy of careful study, and that they may coexist there can be no doubt.

4. Treatment is of very great importance, and special stress should be laid upon climate and occupation. The former should be very temperate and the latter should be a vocation not requiring much weight-bearing. Cold bathing is contraindicated.

5. Proper shoes of the orthopedic type and woolen stockings should be worn at all times.

6. Internal medication may be used for improvement of general health and not for the vasomotor condition.

7. No operative procedures should be performed. No plates should be worn. Cutting of any kind about the foot or toes should be discouraged.

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VII.

THE QUESTION OF BALANCE.*

(Second Paper.)

BY ANSEL G. COOK, M. D., HARTFORD, CONN.

A necessary part of the study of balance is the study of points of contact and bearings.

Levers must have fulcrums, and columns must have foundations. There can be no such thing as pressure without counter-pressure.

Columbus balanced an egg and made it stand on end by crushing the end of the egg so that it presented a flat surface to the flat surface of the table. He might have avoided breaking the egg, had he chosen to do so, by standing it on end in the salt-cellar. In this case he would have increased the bearing surface by crowding the egg a little way into the salt and the convex surface of the egg would have been supported by the concave surface of the salt. Or, again, he might have stood the egg on end, on the table, without the aid of the salt-cellar, by putting a thin piece of bread under the end of the egg. The bread being soft would have adapted itself to the convex surface of the egg and the flat surface of the table, and would have formed a little cup in which the egg could stand.

In the making of shoes and instep supports, we have two surfaces to consider. The surface of the earth on which the man stands corresponding to the flat surface of the table, and the surface of the bottom of the foot corresponding to the convex surface of the egg. The shoe, stocking, instep support, and whatever is placed between the bottom of the foot and the

* Read before the American Orthopedic Association, in Chicago, June, 1908.

ground corresponds to the thin piece of bread between the end of the egg and the table, and must be adapted to both surfaces.

We have, therefore, two surfaces to consider—the surface of the earth and the surface of the bottom of the foot. Whatever goes between these surfaces is what we choose to make. The surface of the earth is flat, nonsensitive, dead. We care nothing for it, except to use it as a foundation on which to build our shoes, and we may use as little or as much of it as we see fit.



FIG. 1.—Ordinary shoe. Heel far back. Pressure on heel and ball only. No support for instep.

The surface of the bottom of the foot is elastic, compressible, concave, convex, subject to changes of pressure and changes of shape, sensitive, alive, and we are compelled to treat it with great consideration. Any shoes or supports that we make must be accurately fitted to the bottom of the foot. They should be sufficiently firm to give support where support is needed, and sufficiently pliable to allow motion where motion is required. They must also be balanced so that in walking or standing, the weight of the body is distributed in such a manner as to cause the least possible strain of the tissues.

In the study of balance, we must also take into consideration, the nature of the substance to be balanced. Supports that are efficient in balancing a flat-iron, might prove inefficient if the thing to be balanced were a bag of walnuts, and, again, it would make a difference whether the walnuts were loosely or tightly packed in the bag.

When we consider a normal foot with short ligaments and strong muscles, the patient standing with bare feet on a flat



FIG. 2.—Ordinary shoe. Short spring. Inefficient.

surface, the points of contact are the heel and the ball of the foot only. When the ligaments are longer (and this condition is so common that I must also consider it normal) the patient standing as before, the points of contact are the heel, the outer edge of the sole, and the ball of the foot. The inner side of the sole of the foot, between the heel and the ball is arched, and the bones composing this arch, are held in position by the shortness and strength of the ligaments. When these ligaments are relaxed they no longer hold the bones in position, and the arch falls, so that the whole bottom of the foot comes in contact with the

ground. The foot is pronated, everted, and abducted, and the inner border, which is normally concave, has become convex.

Patients with moderately relaxed ligaments, not infrequently have the power of standing for short periods of time with normal arches and without pronation. This is the reserve pronation of Lovett and Cotton. The patient maintains the normal position of the foot in standing by the voluntary contraction of his muscles. This involves great strain of the muscles and they



FIG. 3.—Ordinary shoe. Heel far back. Instep supported by metal plate placed between the shoe and the stocking. The ordinary orthopedic instep plate of which there are many varieties.

soon tire. This condition must be recognized and not confounded with the normal foot, where short ligaments hold the bones in position, and the muscles, used only for balancing, are subjected to comparatively slight strain.

In some extreme cases, the relaxation of the ligaments is so great that the foot might be almost called a bag of loose bones, and differs from the normal foot with strong muscles and short ligaments, as a bag of loose walnuts differs from a flat-iron.

It is obvious that shoes that give perfectly efficient support and perfect balance for certain feet under certain conditions do

not support other feet equally well, or even the same feet when the conditions have changed. In other words, we require one kind of support for a firm foot, and quite another kind of support for a relaxed one.

Suppose you were given 20 walnuts and told that without injury to the walnuts, you must arrange them so that they would support a column 8 inches in circumference at the bottom, 6 feet in height, and weighing 250 pounds.

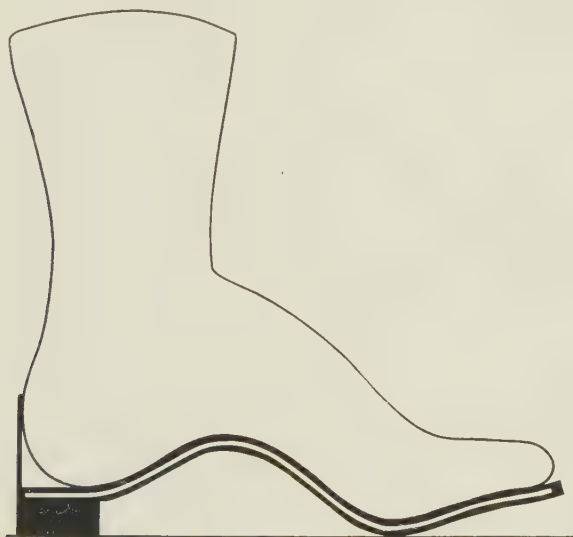


FIG. 4.—Curved arch. Heel far back. Long steel spring, placed between outer and inner soles. Gives perfect support, but prevents toe motion.

You might try piling the walnuts on a plate, but when the heavy column was placed on top of them, they would scatter in all directions. It is evident that the walnuts must be confined in some way, so as to form a unit of suitable shape. You are not allowed to wire the walnuts together, but you might put them in a tin cup 8 inches in circumference, and then if you placed the column on top of the walnuts, they would not scatter.

The twenty walnuts would act as a solid unit, because the pressure from the weight of the column above would be met by the counterpressure from the bottom of the cup, and the pressure

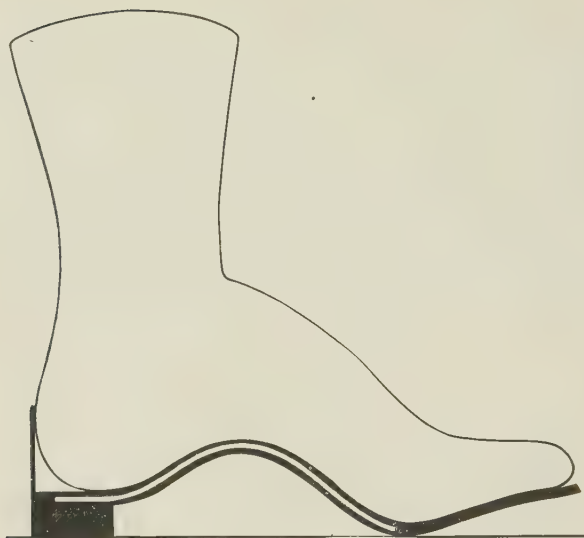


FIG. 5.—Curved arch. Heel far back. Steel spring extending to great toe-joint. Gives good support, allows toe motion, but soon cuts through bottom of shoe.



FIG. 6.—Ordinary Heel. Curved shank iron. Very inefficient support.

on one side would be met by the counterpressure from the opposite side.

It is not always an advantage to invent new names and new classifications for old and well-known conditions, but from the standpoint of balance it is convenient to think of feet as having short, normal, or long ligaments and to remember that these ligaments are not elastic, and that the movements of the bones are limited by the length of the ligaments just as the movements



FIG. 7.—French heel. Gives good instep support, but is so high and small that there is great strain on the ankle-joint and tendency to pronation. Too much weight on ball of foot.

of a ship lying at anchor are limited by the length of the chain attached to the anchor.

Thus with short contracted ligaments we have rigid contracted feet, high posterior arches, high insteps, depressed anterior arches, and flexed toes.

With normal ligaments we have firm feet and normal arches. With long, relaxed, over-stretched ligaments we have relaxed feet, weak feet, flat feet, fallen arches. It is true that certain

flat or weak feet are also rigid, but they are rigid in the position of relaxation, pronation, eversion, etc. This rigidity is due to muscular spasm and secondary inflammation and is quite different from the rigidity of contraction, the result of contracted ligaments.

When the ligaments are short or normal they are strong enough to hold the bones together without external support, and



FIG. 8.—Cuban heel. Gives poor instep support, and has all of the disadvantages of the French heel.

all that is required is to make shoes that fit the feet and then to balance the shoes.

When the ligaments are long they do not hold the bones together and the foot becomes a loose bag of small and slippery bones. These loose bones form but an indifferent support and, profiting by our experience with the walnuts, it would seem probable that they would be much more serviceable if they could be gathered together and converted into a solid unit.

This is the principle of the balance of relaxed ligaments in

contradistinction to the balance of short ligaments or the balance of normal ligaments. You cannot balance a foot with relaxed ligaments because it has no stability, but you can restore it to its normal shape, convert it into a solid unit and then balance the unit. This can be done in a number of ways, some feet require very little additional support and others a very strong and carefully fitted support.



FIG. 9.—The Balanced heel, low. The stout shank iron, supported by the interior edge of the heel, supports the arch.

The problem of the feet with relaxed ligaments is almost as simple as the problem of the walnuts. Place the foot in as nearly a normal position as you think wise. Make a plaster-of-Paris cast of the foot in this position and then make a shoe over the plaster cast and balance the shoe.

If you have made your shoe strong enough the tarsal and metatarsal bones will remain in the position in which you placed them and can no more move than could the walnuts in the tin cup.

A long external and a short internal counter, a support-insole,

and a wide shank made of good leather, together with a good shank-iron, will hold anything human. The astragalus, being above the counters is not included in the unit.

We have now in the reconstructed foot but three kinds of motion: 1. Flexion and extension of the foot on the leg, motion taking place between the tibia and fibula above and the astragalus below. This motion can be regulated by the height of the heel, and when desirable can be absolutely controlled by a double iron



FIG. 10.—The balanced heel, high. The stout shank iron, supported by the anterior edge of the heel, supports the arch.

ankle brace made without joints, riveted to the shank of the shoe below and above to a padded band circling the leg just below the knee-joint.

2. Lateral motion taking place between the astragalus above and the os calcis below. This motion can be regulated by the relative height and amount of extension of the inner and outer sides of the heel, and, when desirable, can be controlled by a double iron ankle brace fastened above and below as has just been described, but jointed at the ankle and provided with a

leather pad and three webbing straps. The leg may be drawn outward or the foot pressed inward by placing the pad against the lower one-third of the inner side of the leg and passing the three webbing straps around the pad, and around the external upright iron of the brace. When the straps are drawn tight the leg is pulled to the outer side. To pull the leg to the inner side place the pad against the outer side of the leg and pass the straps around the pad and around the internal upright iron of the brace.

3. Flexion and extension of the toes, motion taking place between the metatarsal bones and the phalanges at the transverse arch. This motion is regulated by the height of the heel and the flexibility of the sole of the shoe. If it is wished to abolish all motion it is only necessary to extend the shank iron between the outer and inner soles as far as the toe of the shoe. When this is done the phalanges are included in the fixed unit formed by the tarsal and metatarsal bones.

VIII.

A NEW FORM OF SHOEMAKER'S LAST.*

(Second Paper.)

BY ANSEL G. COOK, M. D., HARTFORD, CONN.

In the two years that have elapsed since I read my first paper on the plaster last we have made in my work-shop upward of a thousand pairs of these lasts. This experience has led me to make certain advantageous modifications of the process.

1. Instead of using the steel foot-plate, we now use a wooden foot-board, covered with a sheet of sponge rubber one inch in thickness. The foot-board is composed of a heel-board $11 \times 5 \frac{1}{2}$ fastened with hinges to a toe-board $4 \times 5 \frac{1}{2}$. A thumb-screw attached to the toe-board regulates the angle of the toes. A metal plate padded with sponge rubber and controlled by a thumb-screw determines the position of the heel, and blocks placed under the heel-board determine the height of the heel.

In making the cast, the foot, covered with a plaster bandage, is placed on the foot-board. The anterior arch of the foot should be directly over the hinges, uniting the heel and toe-boards. The sponge rubber allows the foot to retain its normal shape without distortion or flattening, and the foot-board, which has been previously adjusted, determines the position of the foot.

In making a cast of an exceptionally relaxed foot, it is sometimes well to strap up the posterior arch with adhesive plaster before the plaster-of-Paris bandage is applied.

2. We have found that we get a much better cast when the patient relaxes his muscles; this he is more apt to do when seated

*Read before the American Orthopedic Association, in Chicago, June, 1908.

in a comfortable chair, of exactly the right height, with his leg hanging vertically.

We have arranged on a platform, in our plaster-room, a chair with a movable back, and a seat that can be raised or lowered.

3. We have found it desirable, in scraping the cast and making the addition for the toe, to know at all times what part of the last represents the original foot and what the addition. In order to do this we have colored the original cast of the foot blue and



FIG. 1.

placed a blue crayon at the end of each toe, and an additional piece of crayon over the nail of the great toe. The addition is made with white plaster.

In the original paper it was stated that the heel was put on after the last was removed from the shoe. This is perfectly practicable, but shoes retain their shape better if allowed to remain on the last till the patients call for them, and shoemakers are apt to flatten the sole and otherwise distort the shoe in putting on the heel. To remedy this we have added a steel heel-piece



FIG. 2.

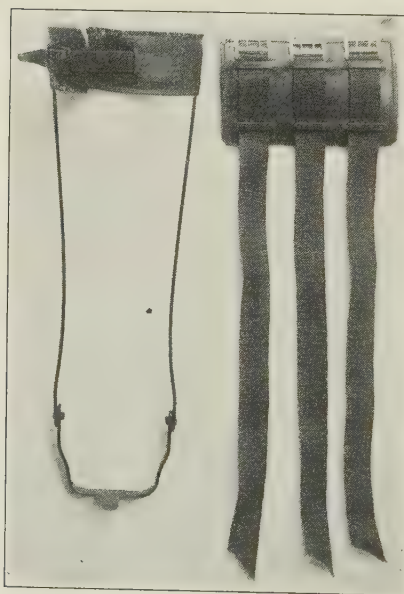


FIG. 3.

which is shellacked on the plaster last. The heel can thus be added to the shoe in the usual manner and before the last is removed from the shoe.

These plaster lasts have proved perfectly satisfactory in our own shop where the men are used to them. When they are broken they are easily mended and when alterations are required, they can be easily scraped or additions made of new plaster. Personally, we want nothing stronger or better.

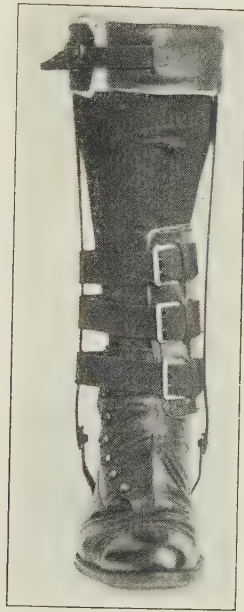


FIG. 4.

When we have sent our plaster lasts to shoemakers used to working on wooden lasts they have invariably objected to them, and by pounding our lasts into small fragments (which we do not deny can be easily done by anyone so disposed) have sought to convince us that plaster of Paris is not a 'fit substance on which to make a shoe. For the sake of the shoemakers, therefore, not that we admit the necessity, we have tried to make

harder casts, casts that the shoemakers could hammer to their hearts' content without breaking.

We have tried adding different substances to the plaster of Paris, viz., soluble glass, alum, gum arabic, dextrin, Portland cement, and wood fiber in various proportions, all to no purpose. Some of these substances render the casts harder, but at the same time more brittle.

The best casts, the toughest and most easily worked are those made of cheap commercial, not dental, plaster of Paris, dried slowly in the open air at ordinary temperature. A last after it is completed can be boiled in paraffin and then electroplated with copper or nickel.

It is also possible to have our plaster lasts duplicated in wood at the lastmakers.

IX.

DIFFUSE PAINFUL LIPOMA OF THE FOOT.

BY A. H. TUBBY, M. S., LONDON, ENGLAND.

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Royal National Orthopedic Hospital.

During the past ten years some examples of an affection—which I believe to be hitherto undescribed—have come under my notice. The trouble, although a slight one, yet causes considerable difficulty and pain in walking, and from its position mistakes easily arise in diagnosis. I append notes of two cases.

CASE I.—A hospital nurse, aged twenty-five, was admitted to Westminster Hospital on May 24, 1906. She had been nursing for nine months. Three months ago she first experienced aching pains in the soles and inside of the feet. The pain was worse on rising in the morning, and for about an hour afterward, but it continued to trouble her for the whole day. Almost instantaneous relief was obtained on lying down or resting the foot, but the pain came on again on walking.

Examination.—On looking at the feet on the inner side and just below the sustentacula tali an oval swelling was visible on each foot. The growths encroached on the weight-bearing surface of the feet. In size they measured 1 inch by 1 1/2 inches. Their characters were those of indolent growths moderately well defined, and without any signs of inflammation over them. They were painful to the touch, and particularly so to deep pressure. The feet were not flat in the ordinary sense of the word. The swellings were diagnosed as diffuse lipoma from an experience of similar cases.

An operation was undertaken, and when the swellings were incised they were found to be of a fatty nature. They were not encapsuled, but the globules of fat of which they were composed were considerably larger and lighter in color than the surrounding normal fat, so that there was no difficulty in dissecting away the whole of the growths. It was noticeable that the tumors

were highly vascular and bled considerably. The wounds were closed in the ordinary way and healed without difficulty.

Dr. Hebb, Physician-Pathologist to the Hospital, made a microscopical examination and reported that no evidences of nerve-endings or of nevoid tissue were found in the tissue, which consisted entirely of fat. The patient presented herself for examination at intervals, but the growths did not recur.

CASE II.—Ethel B., aged sixteen years, was admitted to Westminster Hospital on January 20, 1906, complaining of pain on the inner side of the left foot, which had troubled her for a year. The pain was at its worst after walking, but not severe enough to prevent her from getting about.



To illustrate the appearances in Case II. The position of the lipoma is clearly shown, and its relation to the inner longitudinal arch of the foot is evident. The great toe is in a state of temporary spasmodic dorsiflexion.

Examination.—On the inner side of the left foot there was a round semicystic swelling, about one inch in diameter. The highest point of it was one inch below the tip of the internal malleolus and the lowest point half an inch above the heel. It presented the same physical characteristics as the tumors in the preceding case, and was most prominent when the foot was forcibly dorsi-flexed. The swelling was removed and showed the same fatty and vascular characters as in the preceding case. When the patient left the hospital, she was able to walk without pain.

Remarks.—These cases of acquired diffuse painful lipoma of the foot are clearly distinguishable from that form of gigantism

known as congenital diffuse lipoma, where the affection is characterized by a general hypertrophy of the fatty and subcutaneous tissues first affecting the toes or fingers. It spreads by direct continuity for a time; but as the hypertrophy increases, isolated masses of fatty material appear at some distance beyond the advancing edges. In time these masses become incorporated with the advancing growth. Incidentally, I should add that the microscopical characters of the congenital diffuse lipoma are entirely different from those seen in the painful acquired form of diffuse lipoma. In the former, while the main part of the section is occupied by fat and areolar tissue, yet the interfibrous spaces are crowded by small round cells, not unlike those seen in round-celled sarcoma. Clinically the diffuse congenital form of lipoma is somewhat akin to sarcoma, in that it shows an inveterate tendency to recur very rapidly after removal. In the acquired diffuse form no such appearances are evident, but the blood-vessels are extremely numerous and somewhat hypertrophied. In connection with their origin, cases are met with which throw some light on this point. Such a one is the following, occurring in a girl aged seventeen, which was diagnosed as angioneuroma of the hands. In April, 1907, a swelling formed on the dorsum of the right hand toward the radial side. It was situated over the first and second metacarpal bones and appeared to surround more particularly the extensor tendon of the index-finger.

The growth was always extremely painful to the touch, and sometimes gave her pain even when the part was at rest. The skin over the tumor was hotter than in other parts of the hand; at the center it was red, but there was a dark bluish discolouration around the circumference. The swelling increased rapidly while she was under observation for a few days previous to operation. A mass of nevoid tissue about the size of half a crown was excised through a T-shaped incision.

Dr. Hebb made the following report on the specimen: It consists of fibrous and adipose tissue in which are numerous blood-vessels, the arterial walls being extremely thick.

The left hand had been similarly affected in January, 1907,

when she was operated upon by my colleague Mr. Evans. In January, 1908, she reappeared at the hospital as the angiomatous condition had reformed on both hands. The striking feature of her case was the extreme tenderness, and the parts were so sore that it was impossible to examine them properly. Further, the swellings were hard and appeared hotter to the touch than elsewhere. An operation was undertaken by Mr. Rock Carling, and a considerable mass of nevoid tissue was dissected from the extensor tendons over which it had spread.

Now, in the cases of acquired painful lipoma and in the nevoid condition just described, in which fat was present, we have certain conditions in common, namely, their excessive vascularity, the size and thickness of the vessels, and their extreme tenderness. It is difficult to account for the tenderness. It may be due to irritation of the *nervi vasorum*. Certainly, no nerve fibers or endings could be discovered in the substance of the growths. Whether the acquired diffuse form is due to fatty degeneration of nevoid tissue is not proven, but this possibility should be borne in mind.

We now pass on to certain clinical points. Without careful observation the swellings due to acquired painful diffuse lipoma may partially fill up the arches of the feet, so that the condition can be mistaken for flat-foot; but in all the cases I have seen, numbering now five, the tumors have always been between the inner edge of the sole of the foot and the internal malleolus, and have not extended further forward than the anterior part of the *sustentaculum tali*. In no case have I seen them over the scaphoid or internal cuneiform bone. Their striking features are the slow growth and their indolence, their extreme tenderness and vascularity when cut into. It is also noticeable that any pressure, whether arising from an irregularity on the inside of the boot or from the employment of a "flat-foot" pad renders the patient completely unable to get about on account of the pain.

Finally, on removal, they do not, as far as I know, recur, and in this respect are entirely different from the congenital diffuse lipoma.

I append an illustration of the appearance as seen in Case II.

X

MECHANICAL LESIONS OF THE SACROILIAC JOINTS.*

BY RALPH R. FITCH, M. D., ROCHESTER, N. Y.

The literature upon pathological conditions of the sacroiliac joints is very limited. In years gone by contributions to this subject were published only at wide intervals, and then only in its relation to pregnancy. It was not until 1905, when Drs. Goldthwait and Osgood wrote a valuable paper upon this subject, that the importance of disease or injury of the sacroiliac joints was brought to the notice of the medical profession. Since that time recognition of such cases has been becoming more and more frequent, but to-day the great majority of these patients are still being treated for lumbago and sciatica, without the underlying pathological process being recognized. As evidence that lesions of the sacro-iliac joints are of frequent occurrence the records of the writer show that 5 per cent. of the last five hundred cases seen by him in private practice have had well-marked symptoms due to lesions of these joints.

It is usually taught that normally no motion is present at the sacroiliac articulation. Goldthwait and Osgood have shown that such is not the case. These articulations have the structure of true joints and permit of a small amount of motion; the ilia moving upon the sacrum or *vice versa*, the transverse axis of motion being at the level of the second sacral vertebra. The shape of the articulating surfaces of the ilia and sacrum is such that the surrounding ligaments and muscles are called upon to furnish the greater portion of the stability of these joints. The fact that the lumbosacral cord and sacral plexus are in close

* Read before the American Orthopedic Association in Chicago, June, 1908.

proximity to the sacroiliac articulations is of importance in explanation of some of the symptoms which will be referred to later.

Any form of joint disease may appear in the sacroiliac articulations, the hypertrophic and infectious types being the most common. Mechanical strains so far outnumber all other lesions of these joints that this paper will be devoted to a consideration of traumatic and postural injuries of these articulations.

There are two rather distinct types of such cases. First, those due to some definite injury to the joint, such as may be received from a fall, from parturition, from heavy lifting, or from sudden twisting of the body. Second, those due to any cause which disturbs the normal relation of the spinal curves, thereby tending to tilt the sacrum abnormally. This class of cases is well illustrated by those patients whose tissues becoming relaxed during a prolonged sickness develop a flat back; that is, the lumbar curve of the spine becomes obliterated and the sacrum is consequently tilted at an abnormal angle with the ilia.

In cases of the first type the symptoms will be of sudden onset. The patient will usually say that he has had a "crick" in his back, or that something has given way. Sharp pain will be complained of directly posterior to one or both of the sacroiliac joints. The patient may be unable to move on account of the severity of the pain. As time goes on this pain will become modified, but on account of more or less alteration in the normal relation between the sacrum and ilium, together with the straining or laceration of supporting tissues and consequent swelling with pressure upon adjacent nerves, pain referred to any portion of the lower extremity will follow.

In cases of the second type the symptoms are of slow onset, and the referred pains do not usually develop for some little time.

The chief complaint of any patient with a sacroiliac strain is pain. This may be of any degree from a dull ache to the most excruciating torture. Pain in the region of the joints may be due to the injury of the joint itself, or to muscle fatigue from the attempt of nature to support the weakened joint. The referred pains, of which sciatic is the most severe, represent pressure

upon the nerves in the neighborhood of the sacroiliac joints. The referred pains especially are apt to be of an intermittent type. This is to be explained upon the ground that pressure upon the nerves is regulated by the relation of the sacrum to the ilia, which in turn is dependent upon the position of the patient.

On physical examination a person suffering from a strain of moderate severity of one or both sacroiliac joints will be seen to stand in a stooping position with the body listed to one side, usually, but not always, away from the side which is the more affected. The knee will be slightly flexed. Any motion which flexes the thigh while the knee is extended will cause an increase in the pain referred to the region of the sacroiliac joint and down the thigh and leg. This is because flexion of the thigh, with the knee extended, tightens the hamstring muscles, and as the latter are attached to the tuberosity of the ischium such motion will tilt the pelvis upon the sacrum and thereby produce an exacerbation of pain. Flexion of the thigh, with the knee flexed, will cause no pain, unless such flexion be extreme. Abduction or outward rotation of the thigh do not cause pain, but extreme adduction or inward rotation of the thigh do cause pain since they tend to separate the sacroiliac articulations. There will be tenderness over the affected joint or joints, and all motions of the back, especially in the lumbar region, will be much limited by muscular spasm.

The successful treatment of these cases depends upon restoration of the normal relations between the articulating surfaces of the sacrum and ilia, and the maintenance of such position by proper support. Lateral pressure upon the crests of the ilia tends to separate the sacroiliac joints. Pressure to support these joints must be as low as the level of the great trochanters.

In cases where the strain of the joints is more or less acute, and the lumbar curve of the spine is intact, a nonelastic webbing belt buckled securely about the pelvis, and held in place by perineal straps, will give adequate support. When the patient is lying down a small pillow to support the lumbar spine will be a distinct help in relieving the tension upon the injured joint.

Whenever the strain upon the sacroiliac joint is due to, or

associated with, a flattening of the lumbar spine, this latter condition must first be corrected by hyperextension, and the normal position maintained by suitable means. This may be accomplished by a plaster-of-Paris jacket, which is fitted low down around the pelvis, or better by a spica of the same material which will give more support to the pelvis, and which should be made high enough to thoroughly support the lumbar spine.

When these cases first began to be recognized the severity of the symptoms was taken as a guide to the type of support to be used in treatment. Clinical experience has forced me to believe that the contour of the lumbar spine is the better guide.

Two cases will illustrate the point which I wish to emphasize.

CASE I.—A man with an acute strain of the sacroiliac joints from overlifting was absolutely helpless on account of sciatic pain. He was advised to have a plaster-of-Paris jacket applied, but he refused. A webbing belt was buckled securely low down around the pelvis. In three weeks the patient was walking about without a pain or a limp. At no time was the lumbar curve of his spine appreciably altered.

CASE II.—A woman complained of pain in the lower back running down the thigh both back and front, and extending down the leg to the outer side of the foot. This pain had steadily increased in severity over a period of several months, beginning with a "crick" in her back on attempting to lift a small stove. When the patient was first seen her symptoms were only moderately severe. A belt, altered in various ways at different times, proved to be useless. This patient had a flat back, the lumbar curve was obliterated, and the sacrum consequently tilted at an abnormal angle. A plaster-of-Paris jacket was applied with the lumbar spine hyperextended. For the following three days the patient suffered greatly from pain in the lumbar region, pain which was but little relieved by large doses of morphia. Three weeks from the time the jacket was applied the patient was free from pain. At the end of six weeks the jacket was removed, and the belt reapplied. The pain returned in the back, thigh, and leg. A light steel back-brace which held the lumbar spine in the normal position and also supported the pelvis, relieved her of all pain.

The great majority of patients with acute lesions of the sacroiliac joints may be relieved by low, lateral pelvic support alone.

All cases with flattening of the lumbar curve of the spine must have this deformity corrected and the back held in normal position by suitable apparatus.

After a time, which varies from a few weeks to a few months, according to the individual case, support may be gradually discontinued. At this time exercises to strengthen the weakened parts will be found to be of much service.

Twenty-two cases will be briefly considered, beginning with those due to acute injury. Direct violence was the cause of the injury in two instances. One of these patients was thrown from a sleigh and the other one from a train. Pain in the region of the sacroiliac joints was the chief complaint, there being but little referred pain. Both patients were put up in low plaster-of-Paris jackets which were followed by nonelastic webbing belts held in place by perineal straps.

Three cases were due to pregnancy. In one of these the symptoms became severe at the seventh month. Adhesive plaster strapping entirely relieved the symptoms, and the child was carried to full term. The other two cases had each had a severe intermittent sciatic pain for two years following child-birth. A low webbing extension to the corsets was applied in these cases.

Seven patients had symptoms of sacroiliac strain following overexertion; five of these cases were due to heavy lifting and two were due to attempts at cranking automobiles. Five of these patients were treated with belts and two with jackets, one of the latter being followed by a steel back-brace.

In the remaining ten cases the symptoms were of slow onset, but often severe and most persistent.

One of these patients was a woman with a large pendulous abdomen which was responsible for her assuming an unnatural position in standing. A belt to support the abdomen and give lateral pressure on the pelvis was applied.

A man who had been confined to bed for several weeks after an operation for appendicitis began having pain in the lower back and down the thighs. There were well-marked signs of sacroiliac trouble, and the lumbar curve was entirely obliterated. A plaster-of-Paris spica was applied with the back in the hyperex-

tended position. After many weeks a webbing belt was substituted for the spica.

Four patients habitually performed work which was excessive, considering their physical condition. One stood still all day labeling bottles, another handled heavy cloaks, another pressed clothes, while the fourth did much work in a stooping position, as in picking up potatoes. Three of these patients wore jackets and the other one wore a belt.

In four cases the lesions of the sacroiliac joints were secondary to other pathological conditions in the back, which brought undue strain upon these articulations.

Two of these patients were women with lumbar Pott's disease. In one of them the sacroiliac symptoms were produced by the obliteration of the lumbar curve following the appearance of a kyphos. In the other case symptoms occurred soon after the giving up of jackets which had been worn for over three years.

The third case was a young woman with a nontubercular infection of the lumbar spine which acted as did the acute case of Pott's disease.

The symptoms in the fourth case were due to a relaxation of the sacroiliac joints dependent upon an old infantile paralysis.

These cases have been cited chiefly to show from what a variety of causes lesions of the sacroiliac joints may arise.

The results of the treatment in all these cases were good.

CONCLUSIONS.

Strains of the sacroiliac joints are common. Such strains are the commonest cause of sciatic pain and of pain in the lower back. Tenderness over the sacroiliac joint and an increase of pain from flexion of the thigh, with the knee extended, are the two most important diagnostic points. The normal curve of the lumbar spine must be restored whenever it has been altered. The pelvis must be supported by pressure applied at least as low down as the great trochanters.

XI.

DESCRIPTION OF APPARATUS FOR THE APPLICATION OF PLASTER-OF-PARIS BANDAGES.*

BY NATHANIEL ALLISON, M. D., ST. LOUIS.

The apparatus here presented consists of a combination of the ideas expressed in several forms of apparatus already described. It seemed desirable to combine in a convenient portable form several of the principles that had been discovered to be of use in the application of plaster bandages to various surgical conditions of the trunk and lower extremities. The apparatus consists of a gas-pipe frame, 15 by 25 inches. The lower 10 inches of this frame are covered in with two $\frac{1}{8}$ -inch steel plates, the upper plate having holes $\frac{1}{2}$ inch in diameter, cut through it at equal intervals—7 across and 5 lengthwise. The lower plate has holes opposite those in the upper plate, arranged to catch and securely hold the pins placed therein. Running lengthwise of the frame from this square “waffle iron” are two steel pieces grooved to carry a block. These steel pieces are placed 2 inches apart and are $\frac{1}{2}$ inch wide. The block which travels in the groove between these steel pieces contains a square hole into which pins may be fitted. The pins which fit into the holes of the “waffle iron” are made so as to carry at their upper ends the various plates or notches needed for the supporting apparatus. The pins which fit into the hole of the traveling block are of two varieties; one is a square table to carry the thorax and the other is a “T” piece to carry the irons used in the application of plaster jackets in dorsal recumbency, described as the Goldthwait-Metzger irons. The application of jackets in dorsal recumbency can here be carried out as described by Goldthwait and Metzger.

* Read before the American Orthopedic Association, at Chicago, June 4-6, 1908.

The application of plaster-of-Paris spica bandages to the hip may be made by fitting into the "waffle iron," the pin containing the flat plate to support the sacrum and the table pin into the traveling block. Long straight pins may be placed in any of the holes of the "waffle iron" to secure the pelvis or to supply resistance to the perineum when traction is made on the extremity. In addition, a traction apparatus has been made by placing

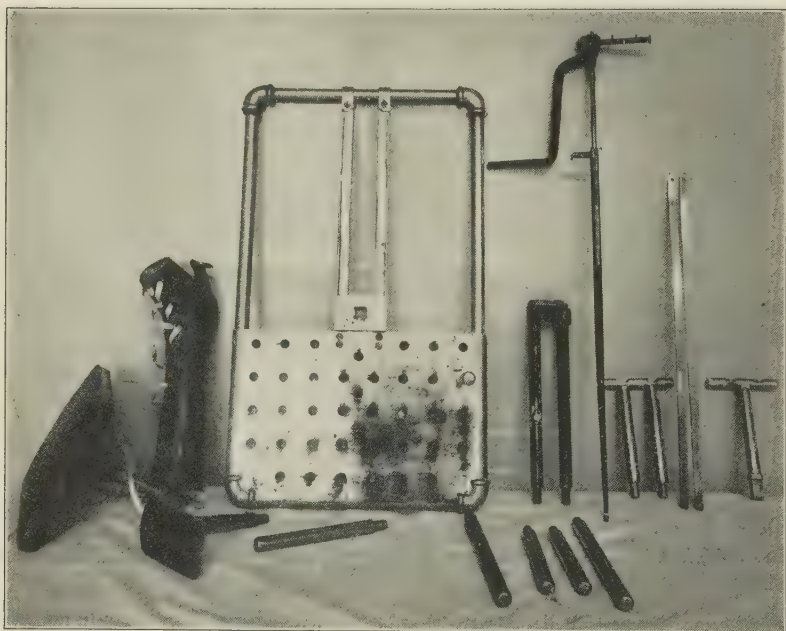


FIG. 1.—The gas-pipe frame fitted with the "waffle iron" and traveling block and the several varieties of pins and rods used.

on two long pins, joined together at the top, a traveler which will hold a rod, the latter being constructed so that it may be lengthened or shortened according to the length of limb. At the end of this rod there is an ordinary ratchet with a handle. The traveler on the pins which are placed in the "waffle iron" may be placed on either one or the other pin according as it is the right or left extremity. It may be placed at any distance from the table and carries the traction rod so that it may be easily detached.

This rod is included in the plaster-of-Paris bandage on the thigh when traction is made by means of straps and a leather boot about the leg. When the plaster has set the upper end of the rod may be easily detached from the traveler and the rod withdrawn.

Where it is necessary to use forcible traction and at the same time fix the pelvis the "waffle iron" and the straight pins may be used with the pelvis placed directly on the surface of the steel plate, the perineum being placed against the two pins with the traveler, and traction may be very forcibly exerted in any direction desired.

The apparatus here described makes no definite claim to originality. Its merits consist in the facts that it is simple, portable and may be used for a variety of purposes in the treatment of surgical conditions of the skeleton of the trunk and of the lower extremities. The writer is indebted to many previously described appliances for suggestions in designing this contrivance.

XII.

THE TREATMENT OF SOME TYPES OF RHEUMATOID ARTHRITIS.*

BY FRANK E. PECKHAM, M. D., PROVIDENCE, R. I.

Since reading a paper on this subject last year I have continued to study these cases from a clinical standpoint and have endeavored to still further push the treatment along lines which offer anything in the way of better results. Although far from the goal I must say that I am more enthusiastic than ever regarding treatment and this enthusiasm must be the excuse for a second paper on the same subject. The types of rheumatoid disease which seem to yield more readily to treatment are what has been described as villous arthritis and the atrophic type of arthritis. Here we have the mushy growth in the joints, particularly the knee-joints and later cartilaginous atrophy and destruction. The etiology is uncertain. In villous arthritis if only the knees and no other joints are involved, the hot-air baths followed by vibration seem to give splendid results. Even in these cases, however, general vibration is usually given and by that is meant vibration with the hard ball over the spinal nerve-centers, with the soft brush over the stomach and liver area, the hard ball again over the abdominal lymphatics and lastly the hard ball over the joints, and after the first few treatments, the pressure on these joints is made pretty firm. The thickened and boggy conditions slowly diminish and the joint assumes a more normal and healthy appearance. It goes without saying that some of the joints either refuse to yield or yield up to a certain point and then come to a standstill. In a number of cases I have recently taken up the use of the wave current, this to be followed by sparking, making use of the spark

* Read before the American Orthopedic Association, in Chicago, June, 1908.

selector devised by Dr. W. Benham Snow. The wave current is used by properly adjusting a flexible metal electrode around the knee, avoiding contact over the patella, and connecting directly with the positive side of the static machine, the negative side being grounded. The patient is seated in a chair upon the insulated table. The current is then turned on and the strength regulated by the spark gap on the machine. The strength of current is always graduated to the tolerance of the patient, also the strength of current should be such that there would be no muscular contraction, for muscular contraction continued for twenty minutes might cause lameness and the patient might not wish for a second treatment.

Immediately following the application of the wave current, the joints are subjected to sparking by means of the spark selector, with sufficient length of spark to penetrate the structures around the knee-joint. In a few cases of villous arthritis which refused to yield to other measures, the application of the wave current with sparking, caused a change which to me was astonishing.

One such case was that of a lady a little over fifty years of age, whom I had treated for two months for a villous arthritis of both knees by means of hot-air baths and general vibration. There was no pain in this case, but stiffness was the symptom complained of. There was considerable thickening of one joint. At the end of two months there was no improvement at all. The hot-air baths were discontinued and in addition to the general vibration, the wave current and local sparking was added to the treatment. There was improvement from the very first application and subsequent sittings only increased the patient's enthusiasm for the electric treatments. Another case of villous arthritis was that of a fleshy woman with both knees somewhat thickened and considerable creaking and grating on motion. There had been inability to go up and down stairs for some months. Two months of hot-air baths followed by general vibration had given great improvement but some slight thickening remained and the grating on motion was still noticeable. At this time the hot-air baths were discontinued and the wave current and local sparking, together with general vibration, con-

tinued. The improvement was much more marked and at the end of another month even the grating and creaking had completely disappeared and the patient was apparently perfectly well.

These brief reports show what this treatment will do for some cases where other methods wholly or partially fail. It goes without saying that some of these joints refuse to yield to any method of treatment thus far employed and the only thing to do is to open and clean out the villous condition and as frequently happens, excise any hypertrophic growths along the ridges of the articular surfaces.

In cleaning out these villous conditions I presume all of our experiences are alike, namely, that the curette is useless. The mouse-toothed forceps and curved scissors must be used and the joint practically skinned. After a few days, hot-air baths and manipulation and the results are usually good.

In the atrophic type of arthritis where multiple joints are involved, there are possibilities in the way of treatment which have much to offer and these perhaps seem to be greater than one year ago and the future looks bright for increased knowledge of the nature of the disease as well as of methods of treatment. It goes without saying that if the cause of any disease can be removed, the trouble must of necessity be cured and the treatment, blindly and empirically though it may have been administered, seems to have been in a general way attacking the trouble more and more along these lines. Reasoning from the effect of the treatment backward, it would seem that the trouble was one of faulty physiological function some where in the economy, the where and the how being perhaps unknown. Consequently if this premise be true it is equally true that treatment which will stimulate physiological activity will surely benefit the conditions under discussion. It seems to be easy in some cases to correctly attribute joint trouble to physiological disturbances. For example, there was one patient, a fleshy woman of about sixty years of age, who had joint trouble only in the stage preceding the passage of gallstones. After the passage all trouble would cease until the next attack. This also leads me to speak of the liver and its importance in rheumatoid troubles. There are many cases where

tender spots are elicited along the spine at the center for the liver and of these there are many who are tender to pressure when the soft brush is used over the liver area. The liver is very intimately associated with metabolism. Poisons produced in or absorbed from the alimentary canal and carried into the blood stream are destroyed or removed by the liver. This was demonstrated by Eck, who excluded the liver from the circulation by making a direct connection between the portal vein and the inferior vena cava. This directly resulted in toxic symptoms. Actual practice has demonstrated to my own satisfaction that there are many cases where the treatment applied to the liver as above described, does a large percentage of the good that is accomplished in the general treatment.

As another example of physiological disturbance, a man, perhaps of forty-five, had an acute attack of indigestion. In this attack one of the knees swelled up, causing considerable pain but on the subsidence of the acute intestinal disturbance, the swelled knee also subsided. It is fair to suppose that from the backing up in the intestine some infection was absorbed and carried in the circulation to the knee, causing temporary trouble. If such a condition were chronic it would also explain some of the joints which present themselves for treatment. Constipation, interfering with the portal circulation, has been the cause of some cases, I am very sure. Chronic gastritis and dilated stomach may also be at the bottom of others. Sagging of the abdominal contents, also cause a variety of symptoms and at times seem to be intimately associated with rheumatoid conditions. This group of troubles with its attendant train of symptoms, is usually very largely, if not completely relieved by an accurately fitted abdominal belt which, by raising and supporting the abdominal contents in a normal or more nearly normal position, assists in a re-establishment of normal physiological functions.

From these cases, if unrelieved, there may result absorption of toxic material or there may be nerve-center disturbance, so that either from toxic or trophic disturbance there may result a rheumatoid condition, that is, joints may become swollen, the larger joints may become villous, there may be in connection also

hypertrophic spicules, some of them of considerable size, the cartilage may become atrophied and in the later stages bones may come into actual contact, resulting in ankylosis. Muscular contractions in neglected cases are not unusual. The earliest symptom is probably one of stiffness followed a little later by swelling. The creaking and grating of the knee-joints is an all too familiar symptom due to the villous condition. With the puffing up of the joints comes the pain and tenderness. It is usually a slowly progressing process although it may come on with great rapidity and accomplish in a few months what in another case might require years. The treatment to be applied is one of stimulation of the physiological processes to perform their functions in a normal or more nearly normal manner and to eliminate whatever of toxic products may exist, also to stimulate the central nervous system as much as may be possible. As indicated, the trouble is one of general metabolism and the treatment must also be general as well as local. This is a very important matter and cannot be emphasized too much. If attention is given *only* to the joints, failure will result. Although hot-air baths for a villous arthritis in the knee, for example, are of great value, they are not of as much value for an all-over bath as the electric light. Radiant heat certainly stimulates the whole nervous system and also by causing sweating assists materially in elimination; two very important effects and produced in an entirely agreeable manner. The patient should be placed nude upon a couch and placed in the electric-light bath in a reclining position, with the head outside. In my own bath the head comes by the side of a window, which can usually be opened. In addition, the head is kept cool by an ice cap or an electric fan, or both. A first bath should be ten or twelve minutes only, succeeding ones longer until the patient remains in twenty or twenty-five minutes. On removal there is administered to those who will stand it, a cold water shower bath and to the others a cold sponge bath, this followed by a vigorous rubbing down with a coarse bath towel. The blood is thus brought back to the cutaneous circulation and a healthy glow is produced. In this refreshed condition the patient is placed on the table and general vibration applied, as indicated

above. Certainly this combination of methods does stimulate and patients go out each time feeling very much better for the treatment. After a while, with the continuation of the treatments, the swelling begins to go and the joints to become more flexible, the pain and stiffness to disappear in proportion. This method has now been in use for about two years and the results are very much better than formerly.

Cases refusing to yield to these methods will now be treated additionally by the wave current, sparks and brush discharge. Already a few cases have been so treated. A lady about fifty years of age had been troubled off and on for a few years with both knees being somewhat swollen and stiff and the finger joints of one hand had become slightly involved. The shoulders and neck at times also had been slightly involved. The knees being the worst joints, local hot-air baths and general vibration were employed and attended by a continuous improvement, but unfortunately she caught the grippe and although the attack was mild it came on after some weeks of overexertion and left her in a debilitated condition. The knees were much worse, there was gastric indigestion and things were looking pretty discouraging. Medical treatment by the family physician for debility and indigestion was of no avail notwithstanding several changes of medicine. Just as I was on the point of losing a patient, the wave current and sparking treatment was begun. The result was magical. After the second treatment the appetite returned, the knees began to improve and after the fifth treatment the patient expressed herself as feeling very much better and had been shopping all the forenoon, something she had been unable to do in a long time. This improvement has continued and all of the symptoms have disappeared, except in one knee, which is also almost well.

A second case was that of a man around fifty years of age, whose knees had been troublesome for three or four years, off and on. For some two or three years the right shoulder had at times been swelled and painful and tender, but had quieted down and after a month's sojourn in the South, everything seemed to be in good condition, when suddenly an acute attack involved the right

shoulder-joint. I saw him for the first time at his home at mid-day. There had been no sleep the preceding night. The joint was swollen, tender and very painful. At 3 P. M. he reported at my office and was placed in the light bath for about seventeen minutes or until sweating had well begun. This was followed by a cold water sponge bath. The pain was slightly relieved. Fifteen or twenty minutes were now spent with the soft brush of the vibrator on the joint alone, as it was uncomfortable to lie down and move around for the general vibration. After this treatment, the pain was considerably relieved and the shoulder could be moved some with great care. Then followed a twenty minutes' application of the wave current and after this, the sparking, when at the end of all treatment the pain had been completely relieved and the patient returned home feeling perfectly comfortable. That night there were 4 hours of sleep and the following forenoon, three more and in the afternoon the treatment was repeated. The improvement has continued and the *general* process bids fair to be completely controlled.

An almost similar history would apply to a lady of about thirty years of age. In such cases it will be seen that the combination of treatment is accomplishing results which I have never before been able to duplicate.

In seeing numbers of rheumatoid cases, it was ascertained that some patients, who were inclined to grow stout, had discovered for themselves that if the weight were kept down by physical exercises, they were free from joint trouble. This seemed so reasonable and so physiological that it was at once incorporated as a principle of treatment and, in so far as it has been put into use, has been successful. Also patients who are inclined to put on weight are at liberty to exclude sweets and starches, etc., from their diet. This brings up the the subject of diet which is a very important one, but I think now that it must be interpreted in a far different manner than formerly. The physiology of the system is really very little understood but all parts of the body are nourished by the food ingested. The various steps of digestion prepare the food for its final distribution to the different parts of the body. The first step in digestion is mastication and this should be done,

as has been so scientifically demonstrated by Mr. Fletcher, in a sufficiently slow manner to learn to enjoy the *taste* of the various foods that are eaten. If the food is chewed sufficiently to really enjoy the taste, this very act stimulates the flow of the gastric juice so that when the food is swallowed the stomach is already in working order to receive it. After eating there should be a period of cessation from active work, both physical and mental in order to give the stomach an opportunity to do a little work.

Abstracting bodily from an editorial in the *Journal of the American Medical Association* of November 30, 1907, the writer says: "It is striking that the laying up in the body of proteins is, save in the growing young, accomplished only under exceptional conditions and that the body seems to have no such place for the storage of proteins as it has for fats and carbohydrates. The amount of breaking down and building up of tissue cells that we can detect seems to be far too small to account for the amount of proteins that is required and yet so far as we know, this is the only purpose for which proteins are indispensable. We know that the characteristics of different cells and tissues depend chiefly or solely on their proteins and the proteins in turn differ from one another in the proportion of the various constituent amido-acids that they contain. Each class of animals has cellular proteins and blood proteins specific for its own kind as shown by precipitin tests and it is possible that the proteins of every individual differ in some respects from those of every other individual. Consequently the conversion of the multitudinous varieties of proteins taken with the food into the constant proteins of the individual cells must require a most complete reconstruction of the food proteins. In the intestines the proteins are split into their elementary constituents, the amido-acids, through the action not only of the trypsin but especially by the erepsin of the intestinal mucosa. These amido-acids are resynthesized into proteins and it seems probable that this process is accomplished by the cells of the intestinal walls and the proteins resulting are those that are found in the blood serum. The excess in amido-acids that are furnished in this way by the food and which cannot be used by the organism for the building up of its own type of proteins are, it is

believed, deprived of their nitrogen by the action of certain enzymes and the nonnitrogenous residue may then be available for furnishing heat and energy. By this means the cells are provided by the blood with protein supplies of practically constant composition and the intestinal wall may be looked on as the guardian of the chemical specificity of the individual. In this case it is easy to imagine that the intestinal wall might, under certain conditions, be unable properly to synthesize serum proteins and from this might result serious disturbances in general metabolism. It will be seen from this description that there goes on in the intestinal wall a selective synthesis by which proteins the serums are utilized by the different cells of the body since the proteins of these cells contain proportions of the various amido-acids different from those of the serum proteins. In the light of this kind of physiology, it is at once evident that the ordinary metabolism experiments are erroneous and that it is the mixed diet of the table that is most advantageous for the deficiencies. Certain amido-acids of one protein may be replaced by a relative excess of the same amido-acids in some other protein."

This is a long quotation, but it tells the story very accurately and shows how important the intestinal wall becomes in these troubles and also indicates the treatment. The diet *must* be a mixed one else there will be a disarrangement of the stream which is continually delivering its contents for absorption. Treatment to affect this process must be given along physiological lines and I doubt very much the physiology of anything put into the stomach and intestines in the way of drugs. They are so changed by the time they reach the intestinal wall that I doubt if they or their results are of much use. Certain it is that with the swing of the pendulum from the so-called drug treatment to that of physical therapeutics the results have been very much better and in some cases almost magical. Where the joint condition is due to the faulty action of the intestinal wall, and in all cases it is assumed that this action is faulty, as well as that of the liver, the treatment is and must always be general because it is thus far impossible to find the exact process at fault and then another point is that there is probably more than one process, because

one acting badly would of necessity make trouble for the next one and so on, making it still more certain that the treatment must be general.

The effect of climate on this affection is problematical but the air that is clear of humidity, whether it be hot or cold, seems to be beneficial and I am inclined to think that a cool, dry atmosphere is more invigorating than a warm, dry one, but even this would act differently upon different individuals.

Infectious Arthritis.

Whether all the types of rheumatoid disease may be due to some form of infection is a question, but that many cases are due to absorption of poisons by reason of faulty physiology of the cells in the intestinal wall and in the liver, as described above, must be admitted. In accordance with this theory the treatments as already outlined should be of the utmost value and indeed daily practice more and more proves such to be the fact. In absorption of poisons during or following infectious diseases, elimination becomes of great importance, which in conjunction with the active treatment of the joints, gives the best results in any individual case. Where the absorption is from the intestines, treatment must be pursued along the general lines before described. It is possible to have a very acute infection, apparently arising from the intestines, where general medical and even life-saving measures are necessary until sufficient recovery allows the taking up of physiological measures. In infection of the tonsils, removal of the tonsils is always advisable after they have been reduced by proper treatment. Infection from gonorrhea has become much more amenable to treatment since the focus can now be attacked with certainty. Rectal examination shows enlarged and tender prostates and enlarged and tender seminal vesicles, or both. You are familiar with the operation via the perineum to open and empty the vesicles. This is a severe and entirely unnecessary operation. You are also familiar with the so-called stripping or massaging of the vesicles. This is nasty, disagreeable and not very scientific. The method which seems to be the most effective in emptying the vesicles and increasing the tone and stimulating the physiological functions of the local joints is as described by

Drs. Snow and Titus and other writers. If the prostate is enlarged the solid metal (Titus) electrode is placed in the rectum against the prostate and vesicles and connected with the positive side of the static machine with the negative side grounded, thus delivering the wave current for a twenty minutes' sitting. After a sufficient number of treatments, the size of the prostate being reduced, the glass vacuum electrode is substituted and this is also the electrode to be preferred against the seminal vesicles when they are distended. If gonococci are present the glass vacuum electrode is connected with the negative side of the machine, when the modality thus applied prevents further segmentation and thus renders innocuous the vesicle contents. These modalities also cause definite contractions of the tissues with each spark across the machine, thus squeezing out the contents of the seminal vesicles. In this manner the sacs are emptied and at the same time their contents are rendered harmless, a much more scientific procedure than digital stripping. At the same time this is being done, the swollen and painful joints must also be treated. This can be done by the brush discharge and sparking if the joints are much swollen, or by the D'Arsonval current, with a glass electrode applied to one side of the joint and a metal electrode on the other.

A complete report of a case of this nature cannot be made but one can be related which responded in a marked manner to the above described treatment when every other method was apparently of no avail. A man of forty-three years of age began to have trouble with his feet and ankles about three or four years ago. At that time this seemed to be flat-feet which were relieved for a while by shoes and supports. The ankles, however, became more troublesome and slowly other joints, especially the wrists and fingers, to a lesser degree the knees, elbows and shoulders, became involved. It seemed at that time an atrophic arthritis. The patient finally became confined to the bed, was sent to the hospital, where hot-air baths were used and last year the electric-light baths were thoroughly tested on him. There were acute exacerbations when the stomach would be all out of order and one or two joints would be swollen more than usual and very painful.

Thinking that the infection might be coming some where from the alimentary canal, fermented milk was faithfully pushed but a severely acute attack came on right in the midst of the treatment; however, it was continued for a while with no results. This past winter there had been a very slow improvement so that with crutches, walking became possible. This seemed to be accomplished by nature rather than by any treatment. During the winter a rectal examination showed that the prostate was considerably enlarged and the seminal vesicles also enlarged and tender. Questioning revealed that twelve years previously he had had a gonorrhea. This was the first time that gonorrhea had come into the story at all. In the late spring the treatment was begun, at first with the solid metal electrode from the positive pole of the static machine inserted in the rectum for twenty minutes. This was followed by sparking and the brush discharge. The brush discharge was the most efficient in reducing the swelling. Unmistakable improvement began with the very first treatment. The sittings have been very irregular on account of the weather, some days interfering with his attendance and some days being so humid that the machine would not generate. Notwithstanding these difficulties, the improvement has been continuous and the patient is very enthusiastic about the result in the joints and also the improvement in the way he feels and in his general condition. Recently during one of our cold waves he caught cold and has not been so well, but this is only temporary. The fact is that he can now walk on a level floor without crutches and can almost dance a jig. As you see, the result obtained so far is only partial but you can hardly realize from any verbal picture the condition of the patient and appreciate what this improvement means to both patient and physician.

The object of this paper is to demonstrate, as far as its material may, the value of physical therapeutics in some conditions which the orthopedic surgeon has to attack and I think that these methods must be taken up, their value and their indications more accurately studied and demonstrated and when this is accomplished, results will be obtained which up to the present time have been well-nigh impossible.

XIII.

THE MECHANICS OF LATERAL CURVATURE.

BY DR. PAUL EWALD, HAMBURG, GERMANY.

In five papers which Feiss has published in this JOURNAL (July, 1906; April, 1907; October, 1907; January, 1908) he has offered a valuable contribution to our knowledge of scoliosis founded on a very broad basis—on anatomic, physiologic considerations, demonstrations on models, pathologic-anatomic observations, and the comparison of healthy with deformed individuals. His conclusions are summed up as follows: "There are certain conditions of normal posture which we assume to imply asymmetrical strains. Although we made no attempt to measure these strains accurately (mathematically), the forces and resistances could be analyzed and arrayed against each other. By so doing, tendencies could be figured out for the parts under strain which could best be studied in terms of distortion. In this way, we found that the peripheral stresses were of seemingly great significance, implying tendencies (as read in terms of distortion) which were very suggestive of the ultimate distortions seen in the pathological skeleton. In order, however, to explain the pathological facts we had to assume that the strains were greater than the resistance called forth in the structure as might be readily supposed on the grounds of prolongation or frequent repetition. Assuming this to be so, there had to be a change of form and substance to conform with the disproportion of strain to resistance, which change continued till the structure became equilibrated to the force. This adjustment of the structure to the force (deformation) seemed to occur chiefly in a given part, namely, the thorax, so that following this the body mass as a whole had to readapt itself to conditions of erect balance (recovery) which implied a second

equilibration of the deformed part to the rest of the body; and this final adjustment was said to represent the state of lateral curvature."

It is not our purpose to examine more closely all the details which led to these conclusions. Everyone who has read these reports will have acknowledged that we have gained much toward the understanding of scoliosis from Feiss' endeavors; not, indeed, relative to the etiology, for that unfortunately remains as dark as before; but relative to the development of scoliosis—the mechanics. Here I believe we are dealing not with theories but with facts and for this reason the studies of Feiss are of especial value. We must, however, maintain that not all the changes of the thorax and of the spinal column are to be explained on the grounds of peripheral strain, but that the peripheral forces which are so much emphasized, *i.e.*, the stresses of those muscles which run from pelvis to thorax, are not the only ones that ought to be considered, but only an important part of the sum total of pulling forces and resistances. Besides the muscles attached to the thorax, the spinal muscles proper certainly have significance as active movers of parts of the column; further, all of the ligaments which connect the vertebræ and preserve the normal relationships of one to another and still further maintain the pathologic positions or even help to increase them by retraction. Feiss himself at the end of his reports has briefly alluded to the important resistance which the inner structure of vertebræ and ribs offer to the deforming forces. Without wishing to lessen the value of Feiss' research in any manner, from a general point of view we must nevertheless lay emphasis on the fact that the operation of the forces and their effects which Feiss has separately analyzed, demonstrated, and individually described, when finally regarded as expressed in their totality on the living body, becomes so complicated in their relations that these do not permit scientific verification. For these reasons a purposeful deviation from the truth and a neglect of the natural relationships becomes a necessity from the very start. In order to attain clearness we have to regard each movement and its effect separately on an inanimate object. In all such scientific research one must anatomize and study the

individual manifestations one after another in spite of the fact that one knows well enough that in actuality things are altogether different?

But, on the other hand, as Feiss has obeyed the broader demands of exact science, the researches are to be regarded as purely physical studies (naturally later with regard to the physiology of the organs) and "theory." On the value of such data are the mechanics founded. An abundance of these data is brought out in the five papers and arranged according to their value, although, according to my idea, not all the details are properly arranged. Our sympathy is challenged because no new theory is set forth in addition to the innumerable old ones to which all symptoms and findings of the disease, whether they accord well or badly, are subordinated.

Feiss starts inductively from anatomical relations of the normal body and then investigates the pathological anatomy of scoliosis more closely and views it with reference to the normal anatomy. This very procedure, starting from normal anatomical and physiological relationships, is ingenious and plausible. It is evident that by such means one penetrates deeper into the comprehension of scoliosis than when one regards the already malformed spinal column with its rib prominence entirely by itself.

An important point to which the author attempts to attract our attention is therefore the fact that the vertebræ move not alone upon one another, but more especially that whole sections of the spinal column move at certain points (eleventh dorsal vertebra, second lumbar vertebra, fifth lumbar vertebra—sacrum).

But I believe that a comparison of the relations of a scoliotic body with particular normal attitudes should not be carried so far as Feiss has carried it. When the scoliotic trunk, bent toward the concave side, is viewed next to the normal trunk bent in the same direction, we must not overlook the fact that the resemblance of the deformed individual to the normal is only an apparent one, that the deformity is for the most part not obliterated, but only disguised. It is something like the genu valgum which apparently disappears in flexion of the leg. But it would not be proper to compare such a bent genu valgum with the normal.

So the position of the scoliotic and that of the normal are by no means identical; let us picture to ourselves how the vertebræ and ribs look from the inside. In the scoliotics with marked rib deformity, pictured by Feiss, the deformity of the individual vertebræ in lateral bending as well as the rib deformation to a great extent certainly persists completely. Roentgen pictures of healthy and diseased cases taken in lateral bending would thus certainly show entirely different pictures of the thorax and column, and if one accurately studied both backs in lateral bending one could also recognize the fundamental differences between the normal and the pathological, although perhaps not so distinctly as in the erect attitude of the body.

What strikes us as new is the extraordinary valuation of the peculiar musculature of the thorax which is supposed to deform first the ribs and then the vertebræ. To be sure, we are already acquainted with a similar demonstration of muscles and, indeed, of the total musculature (Eulenburg). Nowadays, however, the opinion universally prevails of a primary spinal column deformity, whether it be due to congenital asymmetry or variation of individual vertebræ (Boehm) or vertebral deformation (following rachitis, static causes, or superincumbent weight), whereas the musculature is estimated as of merely subordinate significance. It is therefore to be regarded as a great service that Feiss has illuminated the importance of the muscles and especially of the peripheral ones. Feiss strengthens his opinion by experiments on the model, and so demonstrates that the shape of the ribs becomes altered following a resistance of the soft parts in the lower lateral thoracic parieties, and that on account of the altered form and position of the ribs a change of the vertebra can follow of itself. According to many authors, these changes take place as follows: Vertebral malformation (congenital or acquired), on account of which as well as from static causes there develops rib prominence or torsion prominence (on account of torsion or rotation of the vertebræ), muscular degeneration owing to deficient function. Feiss, in order to compare briefly again with the other theory, reasons as follows: Asymmetrical muscle strain prevailing on the one side of the thorax, rib deformation on

account of such strain and on account of such resistances following the application of the strain, vertebral deformation.

So we do not credit Feiss, on the basis of his observations on models alone, that the strain and lateral resistances of the soft parts which brings about a deforming effect on the ribs on the convex side of a thorax becoming scoliotic is sufficiently great to give the same an entirely different form. In the first place, vertebral changes just as great are to be demonstrated in the lumbar part of the spinal column—clinically, the lumbar prominence comes first; in the second place, under primary conditions, long before thoracic changes take place, we must take into consideration also the muscles of the spinal column themselves and further also the static and weight-bearing elements, and finally the resistances in the ligaments of the spinal column.

Further, one also has a certain right to explain the rib deformity on the basis of primary vertebral deformity (torsion), thereby ruling out entirely the tension and resistance of the thoracic musculature. The same changes which Feiss has represented on the model as resulting from tension could be obtained if one proceeded the opposite way, namely, if one bent and twisted the spinal column in the first place (which to be sure, in such a case, could not be a rigid column). In this way the deformity may be produced through the peculiarity of the structure of the thorax in its totality, through the pressure and tension of the elastic ribs, cartilages, and ligaments without the cooperation of peripheral muscles. Must this be conceded? Hardly. By this possibility Feiss' studies do not lose their value, however.

Here it may simply be stated, that these studies do not pretend to the character of strict proof thus ruling out all other possibilities of the development of scoliosis. At present, we do not know whether one or the other or both of these theories may be tenable, and above all cannot rule out the conclusions of Feiss that the peripheral rib parts cause deformation (leaving peripheral strain out of consideration), and that the vertebral changes are purely secondary reactions to thoracic deformities. In his conclusions Feiss himself expresses his apprehension that central strains, such as arise from the column itself, are too little taken into con-

sideration, and in his study of the model of an isolated vertebra with its rib ring, he follows closely the old conception; in order to be able to induce rib deformation, he brings the vertebra out of its normal position and then observes the effect which the resistances have upon the form of the ribs, which tend to restrain them. These resistances are, however, only the least part of the peripheral soft parts; much more important are the interconnections of ribs with other bony and cartilaginous elements.

Another clinical finding, frequently noticeable, speaks against the absolute soundness of the succession of Feiss' conclusions; we frequently find no rib changes, and yet at the same time a distinct deviation of the column toward one side—a scoliosis without torsion. On all these grounds, a modification of Feiss' generalizations would be in order.

The experiments on the model of the thorax (second paper) are very instructive and the findings which are demonstrable from the effect of asymmetrical forces on the peripheral parts are of value. Nevertheless, Feiss himself has said that relations in the living are not so simple as would be represented by the investigation and explanation of isolated facts on the model. Even if it is of consequence to regard the thorax as a unity, yet in such a case we must still recognize the fact that the column is no rigid pillar; that movements inherent in the thorax and in the column as well ought not to be lost sight of; that at the very outset the ribs with their cartilages and ligaments and elasticity are entirely different from the leather strips of the model, and that above all they are living organs; in short, that the thorax is not a dead machine, but that after every manifestation of force a reaction must follow. Indeed, the question must be asked whether we have a right to transfer the laws of physics, as such, to the function of living bone? And if this could be done, whether the interrelations of bones, cartilages, ligaments, interarticular disks, joints, muscles, load strains, and attitudes in their reciprocal activities do not become too complicated to enable us ever to demonstrate the true processes.

And, as a matter of fact, the forces brought about by the resistance of muscles, ligaments, and thoracic parieties—that is, the

forces which Feiss has thrust so far into the foreground—are not in the least stronger than the moving forces; and ligaments and muscles will give according to their extensibility and elasticity.

At the same time, from a general point of view, the question is justified whether the elastic limits in muscles, ligaments, or bones can be overstepped at all in the movements of the living subject. Further, it is to be added that the ribs and vertebræ in a scoliotic individual cannot be normal, but are diseased in their inner structure and must therefore be completely changed in consistency. Feiss must also take into consideration the primary causes, otherwise every human being, or at least every civilized human being, would have become a scoliotic on account of the asymmetrical distribution of stress and pressure in daily life (school, attitude, occupation).

Taking into consideration all these things, one would ask in a somewhat more doubtful mood than Feiss whether asymmetrical pressure and stress are really so significant to the soft parts that they can actually change the shape and direction of the ribs, so that these again can deform the vertebræ as regards their position and shape; or whether it is not more likely that the position and shape of vertebræ and ribs are due to the reciprocal effect of one upon another. That is the great problem that Feiss has brought no closer to solution than Schulthess, Lorenz, Hoffa, Böhm, and many others and the solution of which, so far as we are at present able to judge, is blocked by endless difficulties.

Finally, other orthopedists will take a different point of view with regard to the importance of initial causes in scoliosis. They will maintain in stronger terms than Feiss has done that the entire investigation can have no issue as to the etiology of scoliosis but can only apply to the action which peripheral muscles exert actively and passively upon vertebræ and ribs peculiarly altered in structure under the influence of attitude and load stress. In no case will they admit that the true “cause” of scoliosis deserves notice only in the second place, and that the deeper knowledge of the cause of the deformity cannot advance us in a scientific direction. Let us imagine that we are dealing with a knee contracture in a case of tuberculous arthritis; everyone will concede

that the forces, which have brought on the contracture (muscles and ligaments) and which are automatic, are reactions, but nobody will maintain that they are the cause which has brought about the contracture. The basis of the disease is in fact tuberculosis, not the peculiar mechanics of the joint; the effect of this would have followed in a similar but simpler manner than Feiss has represented so well for scoliosis, but without having weighed all the elements according to their value, an undertaking which, as already remarked, could very well be classed among the impossibilities.

Therefore, even though it be perhaps justified on philosophic grounds, one would not like to see the fundamental causes which Feiss enumerates in his fifth paper, designated as "remote" causes, since we must derive our chief view points from them; because scoliosis develops primarily through their presence, because through their removal the predisposition may be removed and thereby the effect of asymmetrical strains and resistances be checked, and finally because our main therapeutic efforts can thus be best employed (general treatment, improvement of conditions of life, and hygienic environment). Even if these measures are chiefly prophylactic in character, Feiss' investigations nevertheless play a most important part in the special, orthopedic treatment adapted to developed scoliosis, and they give us the most important guide as to the considerations which must govern our therapeutic efforts and their direction; for, if we proceed in a way opposed to the development of scoliosis as Feiss describes it and as it may certainly be accepted either, *in toto* or in part, then we shall endeavor to correct all such deviations from the normal in the most logical manner; and this the more fundamentally, the more we consider and accurately recognize all these factors: namely, that the musculature has deformed a skeleton already changed in substance on account of unequal distribution of strain.

Therefore, one must 1. restore the muscle action to normal, disposing of the muscles of the one side by massage with active muscle exercises for the weakly developed parts on the other side. 2. Treatment of the deformities in (a) the ribs (redress-

ment: active, by position, attitude, and movement; passive, by means of the hand of the patient, of the physician, or apparatus); (b) the spinal column (redressment by similar measures).

Thus Feiss' investigations have the greatest value in that they offer therapeutic view-points. The conclusions which are to be drawn from his observations and reasoning are, it is true, not designed to place the undesirable methods of treatment of scoliosis upon another basis, but they suggest rather the means of placing our empirical measures of treatment on a scientific basis and disposing of what is valueless. Therefore are the investigations themselves so important rather than the conclusions, which are presented with all modesty and reserve, even though later observations may show that the individual inferences have been drawn too partially.

Finally, broader observation may be in order: I refer to the way that Feiss has utilized Greek sculpture, and still more to those anatomic books which are written by artists for artists; because artists have perhaps studied the changes in the attitude of the spinal column more closely than physicians and have represented the changes in the contours of the back by turning the body, by standing on one leg, by lateral bending of the trunk, at the same time omitting the unimportant in the plastic and in sketches and pictures. The reference to these artistic representations is by no means an unscientific proceeding as one hears so often in Germany, but points rather to the peculiar calling of the orthopedist, to make the crooked straight, to transform the ugly into the beautiful. This; as is self-evident, will ever be possible to a certain degree only. Pathological conditions as well as the limitations of our science and knowledge will always, in a great many cases, at least, leave something to be desired as regards the completeness of cure; but the ideal which every orthopedist must aim for must always remain "the beautiful being," a conception to which the artist has educated us, and if therefore physician and artist take hold together at this point, then they may profit one from the other.

EDITORIAL.

There are comparatively few of the readers of this JOURNAL who do not hold positions with orthopedic hospitals or do not have an orthopedic ward in some general hospital. It is therefore quite difficult for most of us to realize what a great disadvantage it is to attempt to practice orthopedic surgery without an orthopedic ward for even our pay patients. How much greater must be the obstacles to overcome, when there is absolutely no place or provision for those totally without means?

When one stops to consider it, there is really a great dearth of orthopedic hospitals. Only a few cities in the United States have a hospital of any sort for cripples, and very few of the other cities have even orthopedic wards in their general hospitals. The same condition exists abroad, for when you consider the importance of this kind of treatment, and the multitude of orthopedic cases, compared with other hospitals, the orthopedic hospital is quite rare. Even when they do exist, no matter in what city or country one visits, one hears the constant complaint of lack of accommodation for the indigent crippled or deformed, not only for children, but for adults as well.

A short time ago, in one of the large cities of the United States, the one containing the best facilities for treating orthopedic cases, with numerous dispensaries, with every hospital of any size having an orthopedic ward, and with the largest hospital in the world for the crippled and deformed, in one day three most distressing cases, distressing because of their suffering and because of the daily increase of deformity, were compelled to return to their homes and wait for treatment until a vacancy occurred for them in the hospital.

Upon inquiry it was found there was absolutely no place in this great city where these patients could be treated at once. With all their facilities, with the largest and best equipped institutions in the world, the best surgeons too, they are not provided with sufficient means to care for their crippled and deformed.

Considering this, how sad must be the lot of all the suffering children in this great land for whose relief there is no provision whatever. After fifteen years of observation and knowing all these facts, it is quite difficult for one to refrain from making a simple and impassioned argument setting forth the necessity of State care of the crippled and deformed. When one reads the various letters of inquiry and application to the Minnesota State Hospital for Crippled and Deformed Children or the eloquent and pathetic pleadings from doctors and parents for admission to this hospital of children suffering from tuberculous diseases of the joints from adjoining States, one cannot but wonder what becomes of those children living in States or cities where no institution whatever exists for their care and treatment; yet there are in the United States to-day forty-seven States and Territories that have no provision for this class of unfortunates. In fact, it is the only class which seems to be almost entirely forgotten by the Government, and yet of all the wards of the State there is not one class for which so much good can be accomplished, achieving not only relief of suffering and protection of the well, but actually a financial investment for the State or Government. It is true that indirectly each county appropriates money for the care of the sick and injured, but this does not cover the proper care of orthopedic cases, for there is not only a dearth of orthopedic hospitals, but of orthopedic surgeons as well. It is true, there are a great many doctors in America to-day who assume that they know something of deformities, and class themselves as general and orthopedic surgeons; some of them hold positions in medical colleges under the above titles, yet how little do they know of orthopedic surgery, especially of mechanical treatment; little do they realize how difficult it is to teach and understand, without an aggregation of cases and an abundant armamentarium.

For the most part, the knowledge they have of this branch of surgery is possibly a fair knowledge of diagnosis and of radical excisions of tuberculous joints, but they are totally unable to follow the mechanical treatment necessary, and they practise mutilating operations for the cure of club-foot or bunglingly apply plaster casts for Pott's disease, or if a case of flat-foot

applies to them they refer it to the shoemaker, or a case of lateral curvature of the spine they send to an instrument house, and the dealer is supposed to suggest and supply the proper appliance. This as we know is not orthopedic surgery. The profession would think very little of a physician who examined a patient, and then gave him a letter to a druggist with instructions to suggest "some remedy," though this is practically true of very many men who think they are practising orthopedic surgery. They are not wholly to blame nor do I think they should be censured, for many of them are practising in counties and States where there is not a single instrument-maker to carry out instructions even if they knew how to give them, nor a hospital properly equipped for the treatment of such cases.

As compared with other specialties, there is very little opportunity for doctors to study the care of cripples in post-graduate schools or as regular students in medical colleges.

Orthopedic surgery and the surgery of children and infants and, for that matter, the medical treatment as well are widely different from adult surgical and medical diseases, that a special education for the doctors and nurses is necessary, and special hospitals, specially built and specially equipped for the making of appliances are imperative. This could not be accomplished in each county in the State economically, but each State could well afford an orthopedic hospital. In fact, it could afford better care for all deformed cases, adults as well as children. It has been found necessary in the Minnesota Hospital to increase the age limit from year to year and there is no reason why it should not include cases of any age, requiring special surgical and mechanical treatment for diseases of a chronic nature. Of course, children will always be largely in the majority.

Of late years many discoveries have been of much benefit in assisting us to get better end results, but not many have shortened the period of treatment, especially in the tuberculous deformities, and it takes months and sometimes years to cure these cases. Hence the importance of an educational department, a school-room specially constructed for tuberculous children, with cots, stretchers, desks, and abundant fresh air. Not only

is this of immense practical value, but of remedial value as well. Many cases receive during their treatment their only education, for of course the State institutions are intended for the indigent only. There is also a class of cripples for which much relief can be obtained and who are mentally well developed, such as those suffering from infantile paralysis of the loss of one or more extremities, or who are otherwise weak, who could in the State institution receive industrial training, adapted to their particular defects, while being improved as much as possible physically by orthopedic treatment. Therefore, such institutions must have at least a threefold purpose: first, as a hospital for treatment of the curable cases; second, as a school for their education; third, an industrial school for training those who can be only partially cured.

For such work to be uniformly successful it must rest with the government, and not with private charity. For statistical purposes, it is hoped that Congress will pass the amendment, which was referred to the Committee on Census, looking toward the collection of statistics and urging State legislation for the cure and education of crippled and deformed children. Should such statistics be procured, there need be no danger of advertising unworthy institutions by furnishing them with names and addresses of such unfortunates and their parents, thus imposing upon their credulity as some might fear, for the following is an extract from a letter in answer to one addressed to the Bureau of Census at Washington:

"In reply to your letter of February 6, should any data relative to the crippled children be collected by the Bureau of Census, it would not be accessible to quacks and others who might make improper use of it, but only to recognized institutions and State authorities."

If we might compare the population of the United States with the census taken in 1904 in Middlefrankonia which showed approximately that 6 per cent. of the population were classed as cripples, then, in the United States, there might be presumed to exist to-day five million and forty thousand cripples.

ARTHUR J. GILLETTE.

DISCUSSIONS.*

I. THE MECHANICS OF THE SHOULDER-JOINT FROM AN ANATOMICAL POINT OF VIEW. JOEL E. GOLDTHWAIT, M. D.

DR. GILLETTE asked what kind of brace should be used in such cases.

DR. GALLOWAY asked whether the cases of subdeltoid bursa are associated with subcoracoid bursitis, and whether it is possible to know whether the trouble is due simply to the coracoid bursa or to the subdeltoid.

DR. ALBEE mentioned two cases that he had had recently, both in young men. One of these patients did have some forward position of the shoulders; but the other was especially erect, being a man of very fine physique. Both had numberless recurring dislocations of the shoulder, which would be dislocated during sleep in the case of one of the patients. This man had frequent attacks of epilepsy. Dr. Albee operated on him nine months ago, doing a modification of Burrell's operation and removing a piece from the anterior capsule. The other patient was operated on in the same manner; and both patients have got along very satisfactorily, going back to work five weeks after the operation. The one with epilepsy has had several attacks of this since; but neither patient has had any recurrence of the dislocation, though both have been playing baseball.

DR. RIELY said that the paper had been very interesting to him, for not long ago he had noticed a click in his shoulder on leaning forward, and he was glad to hear the explanation of it. He had noticed this subsequently on several occasions, but he cannot elicit it at all times. Its presence had worried him, because he did not know what was the cause of it. He asked Dr. Goldthwait whether he thought it ought to be operated on. He thought that if the coracoid was removed the shoulder would come out toward the ribs.

DR. STERN asked Dr. Goldthwait to state his treatment in cases of subdeltoid bursitis.

DR. GOLDTHWAIT, closing, said, in reply to Dr. Gillette, that in writing the paper he had in mind the ordinary spring-back brace. He does not, however, pretend that this will cure all cases. Whatever else is done, Dr. Goldthwait insisted that the results would be more permanent if the fact that the erect position is the stable position were recognized. One other point

*Original papers read at the Chicago meeting of the American Orthopedic Association, June, 1908, and printed in this number of the Journal.

that should be transmitted to the general surgeon, said Dr. Goldthwait, is that the position in which the shoulder is commonly placed after traumatic dislocation is not the best position. The one commonly employed is the equivalent of the forward position of the shoulder. If it is desired to secure the greatest amount of stability, the best position would be to tie the arm to the side, rotating it outward at a right angle. In this position the parts will contract so that the minimum amount of relaxation follows.

In answer to Dr. Galloway, Dr. Goldthwait said that many times the subdeltoid and subcoracoid bursitis are associated, but that often there is no subdeltoid bursa. Of the two, the subcoracoid must be the more prominent. With a subdeltoid bursa, the patient cannot abduct the arm. The mere position of the bursa makes it come between the head of the humerus and the acromion process, so that the inflamed membranes are sliding over each other. The movement does not pull the lesser tuberosity over the coracoid. The arm could be abducted freely, if the humerus were attached to the coracoid by adhesions. Rotation, however, would be impossible.

The supposition should be that the cases were originally subdeltoid bursa cases, but later on involved the two.

In reply to Dr. Riely, Dr. Goldthwait said that the position of the coracoid with reference to the humerus in Dr. Riely's arm was all right. There was no click such as is usually heard in such cases. If that part of the one should bend further, so that Dr. Riely could not get his shoulder back, Dr. Goldthwait said that operation would be advisable to prevent pressure at that point. He referred Dr. Riely to the last number of the *ORTHOPEDIC JOURNAL* for a full explanation of the matter. The procedure does not consist in cutting off the coracoid; and the shoulder is necessarily forward, so that it does not rest on the ribs.

In regard to the treatment, about which Dr. Stern had inquired, Dr. Goldthwait said that it is the treatment of any bursa. If the shoulder is left forward, mechanical irritation will be present, and it will require a long time to reduce the inflammation. This will heal more quickly if the bones are drawn apart.

Dr. Goldthwait said that he had not presented his paper with the idea that operation is not needed or that recurrent dislocation must be due to a forward position. He thought, however, that in a good many cases of dislocation in which there may be a perfectly erect position, some condition such as that described might be found.

Naturally, he said, dislocations very commonly occur at night; because at that time the patients get their arms into all sorts of positions.

Dr. Goldthwait maintained that if an operation is performed the patient should be put into the position of greatest stability afterward. If he is not naturally erect, instead of leaving his shoulder forward, the surgeon should insist upon its being thrown back. Then the results of the operation will be more satisfactory.

Dr. Goldthwait stated it as an interesting fact that apes are constructed very differently from human beings in regard to the situation of the coracoid process with reference to the shoulder. They can put their arms up and get extreme motion without the difficulty that human beings experience in doing this.

II. THE OCCURRENCE OF ANTERIOR POLIOMYELITIS IN MASSACHUSETTS IN 1907. INVESTIGATIONS BY THE STATE BOARD OF HEALTH REPORTED BY ROBERT W. LOVETT, M. D.

III. THE NECESSITY FOR EARLY ORTHOPEDIC TREATMENT IN POLIOMYELITIS. WISNER R. TOWNSEND, M. D.

IV. MYOSITIS OSSIFICANS. DR. PAINTER.

DR. ALBEE wished to add two more cases of myositis ossificans to those reported by Dr. Painter. These were of the traumatic type, and he exhibited x-ray pictures of them. In the case in which the growth of bone was in the calf muscles the only symptom was flat-foot. The patient, a man, gave a history of having had, about fifteen years before, some injury to the leg while carrying a side of beef. The other patient could give no distinct history of injury, but had a slow flexion contracture of the leg, going on to a deformity of flexion at the knee-joint. This case appeared immediately after the first one. By careful palpation of the thigh, a hard tendon was made out under the popliteal space. This tendon felt very much like myositis ossificans, a diagnosis of which was made. There was no pain whatever in the second case, just the flexion deformity.

DR. RIELY said that about three months previously he had seen a case of what Dr. Elliott, with whom he had seen it, believed to be myositis ossificans. The patient, a young girl of seventeen years, had various portions of the body affected with flat, hard plates, like those in Charcot's knee-joints. They were permanent in several places; but, on the other hand, there were also a great many that stayed only a short time, and then gradually softened and disappeared. She had had rheumatism, and had rheumatic endocarditis, but nothing further was known of the etiology of the condition.

DR. H. L. TAYLOR mentioned a peculiar case that he and Dr. Albee had seen within a few weeks past. The patient was a child of three years, with a history of pain in the right lumbar region, the body leaning to that side. In a short time, the pain changed to the left lumbar region, and the body leaned to the left side. On examination, all that could be found was a hard ridge, about two inches long, apparently at the edge of the erector spinæ. A tentative diagnosis of myositis ossificans was made, and a skiagram taken which showed a beautiful needle; there was no history to account for its presence.

V. PATHOLOGICAL ANATOMY OF CONGENITAL DISLOCATION OF THE HIP.

DR. RIELY said that the subject is one of great interest. His own limited experience with these cases had shown that, with one exception, the neck of

the femur was twisted forward, instead of backward. He stated that there are several ways of making a diagnosis as to whether the twist is an anterior or a posterior one. The first of these is by means of the x -ray. If the foot be everted, when taking the x -ray, if the twist is forward, the neck of the femur will make a long shadow; but if the twist is backward, the shadow is short. If it is a posterior twist and the foot is greatly everted, a long shadow of the neck will be produced. In examining the patient, if the twist is forward and the foot is inverted, the great trochanter will be prominent; but if it is a posterior twist and the foot is inverted, the head may be felt more prominently behind than with the opposite inclination.

Dr. Riely then referred to a number of radiograms of the cases in which Lorenz had attempted reduction and of those in which this had been attempted by members of the Association. These were exhibited soon after Dr. Lorenz's visit to this country. Some of them showed that the trochanter, instead of the head, was in the acetabulum. These cases had had a posterior twist instead of an anterior one; and the neck, instead of being twisted back on the shaft, was twisted forward.

A great deal of difference in the result is made by the position the legs are put in before the plaster is applied. The first case noticed by Dr. Riely in which the neck was turned forward was in a child brought to him to have its leg straightened. On examining it, he found the head of the femur out and forward; and the child held its leg in the position that Lorenz puts the legs in with his apparatus. Putting the child's leg in any other position produced great pain. Dr. Riely turned it in and abducted it, and succeeded in getting complete cure.

The next case was that of a girl eleven years old, on whom he operated twice by the Lorenz method, both times failing. He then did an open operation, and found that the head of the neck was twisted forward, instead of backward, which was the cause of the failures.

VI. ANATOMY OF CONGENITAL DISLOCATION OF HIP. DR. W. G. TURNER.

Dr. TURNER, closing, said that to make use of the x -rays in the diagnosis was all very well, but that a man should have committed himself to an opinion before having the x -ray made, or use this last as confirmatory evidence.

He had never seen a distinct posterior twist. The anterior twist has been recognized for some time.

VII. PAINFUL FEET OF RAYNAUD'S DISEASE; REPORT OF A CASE. H. AUGUSTUS WILSON, M. D., CHARLES S. MUSCHLITZ, M. D.

Dr. GILLETTE asked the name of a disease quite similar, described by Weir Mitchell, and remarked that this case resembled it.

Dr. WILSON, closing, said that the other disease was called erythromelalgia. The two conditions, he said, do resemble each other in some respects, but differ materially in others.

VIII. THE QUESTION OF BALANCE, ETC. DR. COOK.

DR. JOHN RIDLON, of Chicago, said that he had been using the plaster shoe, after Dr. Cook's method, for about a year and a half. He thought that one criticism that he had made to Dr. Cook during the winter was justified; that is, that in making his plaster last he uses a board to step the foot on. This means that there is a sloping surface from the heel to the ball of the foot, which shows to a considerable extent in the shoe. The suggestion that Dr. Ridlon had made was to take an oblong piece of sheet steel larger than the foot and bend it for each individual foot depending upon the height of the heel desired. On this plate place a piece of sponge rubber and make an imprint of the sole. This makes a shoe with a bottom a little better adapted to the foot than a last made from a mold on a sloping board.

DR. RIELY said that he had been using Dr. Cook's method during the last eighteen months, and had found with it the same fault that Dr. Ridlon had. Instead of using steel, as did Dr. Ridlon, he had employed aluminum, bending it to each individual foot in the manner described by Dr. Ridlon in connection with the steel.

In applying he cast to the foot, Dr. Cook used to run several turns of bandage around the plate and the foot to hold the plate to it. Dr. Riely had found that this has a tendency to flatten the arch and spread the heel. He has, therefore, abandoned it, and now finds his fits much better than formerly.

IX. MECHANICAL LESIONS OF THE SACROILIAC JOINTS. RALPH R. FITCH, M. D.

DR. SILVER, Pittsburgh, said that there were two questions regarding this important subject which he wished to ask Dr. Fitch. While in the majority of cases it was possible for him to be fairly confident that he was dealing with a sacroiliac affection, there were a number in which the symptoms were obscure and in which the diagnosis was assured only after making a therapeutic test by fixing the pelvis; he did not know of any one constant symptom, and asked whether in any of Dr. Fitch's cases this therapeutic test was necessary for diagnosis. He had seen a few cases in which the pain and tenderness extended down to the coccyx, and some in which the coccyx seemed to be the chief seat of the trouble and in which relief was obtained by support; he wished to ask whether this was a common occurrence.

DR. PAINTER said that in the main he agreed with Dr. Fitch in what he had said concerning the treatment. He thought that there was no question that the majority of the cases can be satisfactorily handled by some form of mechanical support—strapping, braces or plates. Occasionally, however, patients have to be confined to bed; and when this is so they are better handled by plaster spicas. There are occasionally cases that have to be subjected to manipulative measures, with a view to altering a relation that

may not be visibly disturbed. Manipulation under anesthesia will often give a relief that mechanical measures do not afford.

Dr. Painter said that it might be of interest to speak of a case that had come under his observation during the winter, in which all the conservative measures referred to were tried in succession, over a period of six or eight months, upon a powerfully built teamster of twenty-nine years, who had had in July of last year his first severe seizure of pain of the sort described by Dr. Fitch. This was accompanied with a very decided list of his trunk, and he was obliged to give up his work, that of driving a beer-wagon. In connection with this work, he had to load and unload heavy cases of beer. As an avocation, he was on a tug-of-war team; and it was while following this amusement that his first sudden seizure came on. After conservative measures had been tried without avail, he was anesthetized and it was found that a loud, snapping noise was produced when, while he was lying on his face, the thigh on the affected side was forcibly extended. When he came out of the ether, the symptoms, which had been excruciatingly severe, had disappeared. After having been restrained in that posture for a time, he was able to return to his occupation and follow it for some months. Early in December, however, he had a recurrence and conservative measures were again tried without effect. Manipulative measures under an anesthetic were again resorted to. Although the same result was obtained as on the first occasion, the effect did not last; and the list did not disappear as it had the first time. Dr. Painter then determined to try arthrodesis. In order to get at the synchondrosis, it was necessary to resect a part of the ilium commencing at the notch, forward along the crest of the ilium for perhaps five inches. Beginning at that point, and extending down through the body of the ilium, an incision five inches deep was made; then upward toward the sacrum, to expose the synchondrosis. By removing the cartilage with a chisel, he was able to produce conditions like those produced by an arthrodesis. The flap was turned back, but not stitched. The muscles were sewed to their attachment, and the wound was closed with drainage. The man was kept in bed for six weeks without plaster, and then got up with a tight belt. For two weeks he was not allowed to walk. The operation was done early in February, and no symptoms have since occurred. The pain has entirely disappeared. He is working at his occupation now, and has been since the 1st of May.

DR. ANSEL G. COOK, Hartford, said that there had been plenty of these cases in his city, most of which had been relieved. He wished to call attention to a new symptom of the condition. Dr. William Porter, Jr., of Hartford, had called attention to the fact that by putting the finger in the rectum it is possible to reach the sacroiliac joint; and Dr. Cook said that Porter had found that in such cases it is extremely tender to pressure from that side. The patient would suffer great pain when the joint was pressed upon there; but when pressed upon from the opposite side, would have no pain at all.

Dr. Cook had verified this statement in six or seven cases in which he had found this pain on making such an examination. He did not know how constant the symptom is; but Dr. Porter picks out patients by it and sends them to him, making no other examination whatever.

DR. FITCH, closing, said, in answer to Dr. Silver's question about the presence of any one definite symptom, that he would not state that such a symptom has been produced. In a certain number of the patients that he had seen there was pain referred to the sacroiliac joint, but without tenderness; at times pain, which ran down the thigh, was the only symptom. The history, however, was so definite and corresponded so closely with that of other cases exhibiting symptoms referred to the sacroiliac joint that he regarded them as such and relieved them.

He had seen one or two cases with pain referred to the coccyx, as Dr. Silver had mentioned, and without pain elsewhere. Dr. Fitch considers the pain to be possibly due to the congestion and swelling around the strained joints, and to pressure upon the nerves that supply the region of the coccyx.

He acknowledged that it had been a distinct omission not to mention the line of treatment under ether suggested by Dr. Painter, which is very necessary at times. He had been much interested in the case described by Dr. Painter. He was also glad to hear of the new symptom mentioned by Dr. Cook. So many tissues overlie the sacroiliac joint that it is difficult to get at it in the usual way; but when you press down over the rectum, this makes it easier to elicit the pain.

REPORTS OF SOCIETIES.

The following paper, which is presented here in a much abbreviated form, was read before the Medical Committee of the

INDUSTRIAL SCHOOL FOR CRIPPLED AND DEFORMED CHILDREN.

December 30, 1908.

Address by FRANCIS J. COTTING, President.

The movement for the education, technical and otherwise, of cripples began in Germany in 1832 with the founding of an institution at Munich. Others were started in 1840, 1841, 1845. There then followed a lull for fifty years, while the movement spread into other countries. In England a series of institutions were founded from 1851 on, which are now seven in number, with sixteen day schools in addition. In 1872 an institution was opened at Copenhagen, and it is interesting to note that the Danes were the first to realize the importance of cooperation between physician and school. In the eighties the movement started in Sweden, culminating in a school at Stockholm in 1890 and a Cripple Home in Christiania in 1894. In Holland a society was formed in 1891 for the cause and an institution opened in 1900. The movement in the North, between 1872 and 1905 cared for 10,000 cripples.

In 1905 Germany again took up the cause of the "poor in body" and the number of her institutions increased to thirty-two. In southern Europe we now find in Switzerland an institution at Zurich; three in Austria; one in Hungary and eleven in Italy.

At present there is a great movement in Germany to aid this class of unfortunates—the result of a recent census of cripples. In the past year alone, eleven new homes have been added to the thirty-two already in existence; of these some are now open and the rest are in preparation. These recent statistics show that there are 80,000 cripples among school children, and accommodations for less than 3,000 in the institutions, all of which are filled. The physicians consider that 40,000 of these children are in need of homes because their environment is so unfavorable to their infirmity that nothing short of a home for cripples, combining orthopedic clinic, common school and industrial training, would suffice to make them self-supporting. It is interesting to know that, of these 40,000 needing a home, only 9,000 desire to go to such a home. The doctors estimate, therefore, that if 10,000 could be accommodated, it would be sufficient to relieve the severest need.

Let us now consider the movement in our own country. I regret to say that no census of cripples has ever been taken. I have endeavored by means of a circular letter, first to the Supt. of Education and then to the Board of Charities of each state, to gather some statistics personally in regard

to the number of cripples in our country and the number of institutions for their care and education, but have met with little success, most of the replies being, "no statistics and no provision." The few figures that I have succeeded in collecting are not reliable, but it is thought that Ohio and Massachusetts have each about 3,000 crippled and deformed children. It is impossible, therefore, to make any estimate from actual figures. We know, however, that Germany, which had in 1900 a population of 56,000,000 has 80,000 crippled children of school age. Does it not seem probable that the United States, whose population in the same year was 76,000,000, 20,000,000 more, must have at least 110,000? This of course, is only a suppositive figure. I have heard it stated that Germany would have more cripples to the thousand inhabitants than this country, owing to the crowded and unhealthy condition of the homes of the poorer classes. On the other hand I have also heard the statement made that in "the land of the strenuous life and of immigrants" the number of cripples would exceed that in Germany. Germany has an accommodation for 3,000, as I have before stated. From our scanty statistics we may conclude that we have probably accommodations for less than 2,000 in this country. Are we not decidedly behind in our provision for this unfortunate class, although almost every State has made provisions for the feeble-minded, deaf and dumb, and blind.

The movement seems to have started in 1863 with the incorporation of the New York Society for the Relief of the Ruptured and Crippled, followed in 1866 by the establishment of the New York Orthopedic Dispensary and Hospital; 1877, the Orthopedic Department of the University of Pennsylvania, Philadelphia; 1822, Home of the Merciful Saviour for Crippled Children, Philadelphia; 1894, the Industrial School for Crippled and Deformed Children, Boston, the first of its kind in the country, being a day school only; in the same year the New England Peabody Home for Crippled and Deformed Children, Hyde Park, Massachusetts; 1897, Minnesota State Hospital for Indigent Crippled Children, St. Paul; 1899, one school was established by the School Board of Chicago and subsequently a second school; 1900, New York State Hospital for the care of Crippled and Deformed Children; 1906, the Widener Memorial Industrial Training School for Crippled Children, Philadelphia; 1908, Massachusetts Hospital School, Canton; and about this time in Cleveland, a small school for the crippled, and also a home called the Holy Cross House. Besides those already mentioned in New York, there are now, I understand, eight day schools for cripples in New York City, whose dates of establishment I do not know, and the House of St. Giles the Cripple, a hospital and school in Brooklyn. There may be a few other homes and perhaps schools that have not come to my attention, but I think my list takes in practically everything.

The great impetus of the movement in Germany of late is shown in the publication of a journal entitled "Provision for Cripples." I have a copy of the first two numbers. The first came out last June and it contains much interesting information in the form of essays and reports made at the Congress of surgeons, orthopedists, etc., held in Berlin in Easter week, the second afternoon's session being devoted exclusively to discussion of provision for cripples.

It is of interest to note the point made by Dr. Rosenfeld that in an institution for cripples "The curriculum of elementary instruction should resemble that of the public schools and the department of industrial training must embrace many crafts."

Dr. Bade, of Hanover, emphasizes the quality of the industrial work saying

"In the crafts, the pupils must produce wares of the first quality because in quantity they will never be able to compete with normal labor." This I think we have realized and it is our constant endeavor to produce only work of the first quality in our industrial departments.

Such excellence can only be attained by individual teaching and therefore there must be very small classes. On this subject Director Delitsch of Plauen says:

"The cry for smaller classes in the public schools comes home directly to the organizers of schools for cripples. If fifteen or at the most twenty pupils are considered the right number for classes in extra-tuition, surely in institutions for cripples the classes should be kept as small. Even this number appears too high in view of the pupil's need for technical guidance from his teacher. In order to obtain such aid, only one- or two-seated benches built in a practical manner should be used." I think this point of individual teaching has always been recognized by us. We have 75 pupils in our regular school which consists of eight grades. The seating capacity of each school-room is twenty-five, but each grade or class consists of only nine or ten pupils. We have twenty-six industrial pupils at present and our industrial classes never number over ten, and more often are comprised of six or seven scholars. When our plan is perfected we shall have 100 regular pupils, twenty-five in four class-rooms and twelve or thirteen in a class; also fifty industrial pupils. We have certainly met the matter of practical benches in the best possible way with our specially constructed desk and chair for each pupil.

Director Delitsch also says:

"While some children in the institutions have met with only bodily injury, others are mentally affected by deformity or a bad case of rickets. Sometimes deformity or paralysis of the limbs appear as symptoms of a general arrest of development culminating in feeble-mindedness. An educational institution ought by no means to be burdened with such unfortunates. They belong to an asylum."

Let me state another point made by Dr. Rosenfeld, advocating the establishment of institutions for cripples in the large cities. He says: "Such institutions do not properly belong in the country, but in great cities or their immediate vicinity, in order to attain the best instruction and medical staff." In this country it is interesting to note that almost all the institutions for cripples have been established in the large cities. It also seems well here to speak of the economy of large institutions. They are cheaper in the whole management, besides giving the pupils instruction in a greater variety of branches.

The doctors abroad emphasize the advantage of the cooperation of physician and school. This has been appreciated by us, and we consider our present method a good one, namely, to have a monthly visiting physician at the school and satisfactory arrangements with the out-patient departments of the hospitals. An advance in this direction has been made the past year by the appointment of specialists on our Medical Committee. Thus the attention that we are giving to the eyes, ears, and teeth ranks us in this respect higher than the public schools. Also the employment of our trained nurse the past summer to visit at the homes of the pupils and keep in touch with them during vacation is surely another step in the right direction, and I hope has shown such good results that in future this position will be for the whole year instead of, as in the past, for the nine school months only. During these nine school months in the last few years our nurse has visited at the

pupils' homes and impressed upon the mothers the advantages of fresh air and good nourishment. We have found it a great success; and also the summer outing of two weeks offered to every pupil.

Several of our pupils after graduating from the regular school have returned for further training in the industrial departments. For instance, there is one boy who entered the school in 1897 (disability, hip disease), and is still with us. He is now earning about \$12.00 a week in the printing department. There is also a girl with hip disease who went through our regular school, was then able to attend the public high school, and after completing her course there returned to this same department. She does proofreading and type setting and is earning \$7.00 a week. In all the industrial departments the pupils are paid as soon as they become proficient. Thus we are fulfilling the purpose of the school, which is to make the cripple capable of self-support that he may not become a burden on the community. Besides those pupils that are receiving pay at the school a number of our pupils are working outside and earning fair wages. It is not always possible, however, to make all our cases self-supporting, on account of their infirmities, and often we must be content if we have been able to train them so that they can earn at least a partial livelihood. We feel gratified that a number of cases have been, shall we say "cured," so that we have discharged them from our school to go to the public school.

These few facts which I have put before you go to show the importance of systematic and far-reaching provision for cripples, not only on medical and humanitarian grounds, but as a solution of a grave social problem. Every cripple who is trained to be self-supporting becomes a tax payer, who untrained would have become a pauper. It is my sincere hope that a census of cripples will be taken in the United States very soon, and that this census may have the same result as in Germany.

For further information on this subject, *vide* articles by Rosenfeld in the *Zeit. für. Orth. Chir.*, Band XXII, 1-3 Heft, 1908, and also by Lovett in this same number of the *Zeitschrift*, on the case of Cripples in the United States.

In the same number Aberle contributes an article on their care in Austria-Hungary.

Biesalski reviews the present state and distribution of the care of cripples in Germany in this same number.*

IN BEHALF OF INSTITUTIONS FOR CRIPPLED CHILDREN.

For the purpose of publishing complete statistics of the institutions in the United States of America devoted *wholly* or in *part* to the care of *mentally sound crippled children*; the object of such institutions being surgical and medical treatment, education, manual and industrial training, or any one of these features; I earnestly solicit information from persons associated with such institutions or having knowledge or addresses of same, on the receipt of which, blanks indicating the information desired will be forwarded.

It is undoubtedly true that a better knowledge of the work behind done for crippled children in our country will stimulate a general interest, which will in turn redound to the benefit of each institution. The collected statistics will be published in America and abroad, therefore it is desirous to

*In connection with the editorial which is published in this number this paper will bring a good deal of light to bear upon the problem concerned with the case of the crippled.

give America due credit for the efforts being made to benefit and uplift helpless crippled children.

The following is an outline of the information desired: 1. Name and address of institution. 2. Date of establishment of institution. 3. How supported. 4. Number of pupils. 5. Day pupils. 6. Resident pupils. 7. Provision of surgical care. 9. Educational courses. 10. Manual training with account of product. 10. Special feature and aim of institution. 11. Age at which children are admitted. 12. Age at which children are discharged. 13. Average length of stay in the institution. 14. List of medical and surgical staff. 15. Provision made for children after leaving institution.

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THE FIFTH CONGRESS OF THE ITALIAN ORTHOPEDIC SOCIETY.

Held in Rome, October 26, 1908,

AT THE ROYAL SURGICAL INSTITUTE AND HUMBERT I. POLYCLINIC.

(Summary of transactions, as reported by the secretary, Dr. V. Nicoletti, and translated for this Journal by Dr. Calvin Gates Page, Boston.)

The Fifth Congress of the Italian Orthopedic Society was held in Rome, October 26, 1908, fifty-four members being present, besides the following officers: *President*, PROF. CLEMENTE ROMANO; *Vice-President*, PROF. RICCARDO DALLA VEDOVA; *Secretary*, DR. VINCENZO NICOLETTI; *Vice-Secretary*, DR. VITTORIO PUTTI, *Treasurer*, DR. MARIO SERENA.

After an opening address by the president, a report on the Treatment of Joint Deformities, written by Prof. Durante, was presented, and in the absence of the author his conclusions on bloodless operations were read by the secretary.

Prof. Salaghi, of Florence, made a report on the Mechanical Orthopedic Treatment of Joint Deformities. In general he observed that sometimes the prophylaxis coincided exactly with the treatment of the deformity itself, and he condemned the irrational methods of certain surgeons who immobilize joints even in simple contusions and sprains. He declared himself entirely opposed to the forcible correction of various contractures, both on account of local results and the danger to the life of the patient. He justly observed that the reactions following *brisement forcé* necessitate the suspension of treatment, thus losing the advantage gained.

He prefers manual gymnastics to those with apparatus, restricting the use of the latter to final treatment. With regard to treatment for contraction of the shoulders, he told of splendid results following gymnastics and massage. For fracture of the elbow, he thinks it advisable to give up immobilization from the very first, considering that a false joint would be a favorable result. He called attention to the necessity of reducing to a minimum the immobilization in fractures of the lower extremity of the radius, to avoid rigidity of the wrist, especially in elderly persons.

In hip disease, unless serious, the reporter does not believe it necessary to use HESSING's apparatus on account of the difficulty in making it, and also because of the atrophy of the muscles which follows its application. He prefers instead a simple apparatus of leather, including the thigh and buttock, analogous to the plaster apparatus of Calzoncino.

In rachitic genu valgum in children, he uses during the night and for some hours during the day the simplest splint of Owen; then he uses a small

portable apparatus which prevents the bending of the knee. In many cases of club-feet three turns of figure-of-8 bandage carefully applied serves better than any sort of orthopedic apparatus to conserve the progressive correction obtained by manipulations.

In discussing Prof. Salaghi's report Prof. Galeazzi called attention to the necessity of medical and surgical supervision of mechanotherapeutic "Institutes," and to the advantages of the Bier-Klapp treatment. Prof. Serena and Prof. Clemente Romano called attention to treatment by salts of lithium and by electric mud baths.

Twenty-one communications were presented in order:

1. Prof. Dr. Giulio Anzilotti (Pisa): *The Osteogenetic Action of Gelatin and Salts Calcium*. (A clinical and experimental study.) The author has continued researches already communicated to the Society in 1907. He has practised on various patients injections of gelatin containing 0.50-1 per cent. of chlorid of calcium (deep injections into the gluteal region). He has proved that such injections exert a most beneficial influence, not only in regard to consolidation in cases of fractures in normal individuals, but especially in cases of retarded consolidation, of false joints, and of extensive destruction of the diaphysis of the long bones by osteomyelitis. Experimentally, in rabbits and guinea-pigs, he has obtained with injections of gelatin and chlorid of calcium very rapid consolidation of the callus of the fracture, and histologically has noted an abundance of new formation of the osseous tissue.

Chemically, he has noted no increase in the ash (sometimes a diminution) of the bones of the animal treated with injections of gelatin alone.

In regard to the action of gelatin, Prof. Anzilotti believes that it excites the formation of the fundamental substances of the bones, and fixes the lime in the organism, so that it may be utilized at the point where it is needed, as he believes there is a diminution of the ash of the bone at a distance from the fracture.

2. Dr. Vittorio Putti (Bologna): *Intraarticular Injection of Oxygen as an Aid to Radiographic Diagnosis*. This method is not used as much as it deserves to be, on account of the complexity of the apparatus required, said the speaker, who went on to show by means of projections the radiographic results with such injections into the knee-joint, which, better than any other, on account of its anatomical relations, lends itself to insufflation. At the Rizzoli Institute they are experimenting with oxygen injections in congenital dislocation of the hip. The author demonstrated and explained a small, simple apparatus by which he can set free chemically pure oxygen at a low pressure.

3. Dr. Guiliano Vanghetti (Empoli). *Secondary Plastics*. According to this speaker, recent cases of plastic operations show the necessity of adopting the procedures—in amputations that render them possible—which he has already indicated under the title of "Transitory Amputations."

(a) Setting in order the tendons at one and the same level (before cutting them) with association or discarding the less important ones.

(b) Re-establishing some function important to the mutilated limb.

(c) Miserly resection of the bone according to the method of C. Bunge (clean-cut circular incision of the periosteum, denuding of the distal part of the bone, cutting this 2 to 3 mm. from the line of the periosteum).

(d) Formation of the stump and fixation in the best position for preserving some activity of contraction.

In conclusion, the speaker said: Amputations made with orthopedic

intent should be called *rational* to distinguish them from summary, unavoidable ones, which ought to be called *brutal*.

4. Dr. Piero Palagi (Milan): *Radiographic Studies of Alterations of Development of the Skeletal System*. At the Institution for Rachitics at Milan the author studied three cases of retarded development, from clinical and radiographic standpoints. In the first case he found infantile myxedema with typical clinical symptoms, and by the x-ray showed evidence of delayed ossification. In the second case, which was especially interesting because of its rarity, in a girl of eleven years the author demonstrated a fetal hyperplastic chondrodystrophy characterized in the radiogram by the enormous proliferation of the epiphyseal cartilage, and the abnormality of the beginning of ossification of the epiphyses as well as the retarding and irregularity in the ossification of the short bones of the feet and hands. In the third case, in which the history and the clinical symptoms suggest a rachitic dwarf, the radiographic report proved that it was evidently a case of osseocartilaginous dystrophy with many points of similarity to achondroplasia.

In want of more precise data that could be furnished by histological examination and by the uncertainty still reigning in the pathogenesis of infantile osseodystrophies, the speaker did not feel authorized to establish for this case an exact diagnosis. He suggests the hypothesis that it seems like a rachitis supervening in a subject with achondroplasia or a transitional form between rachitis and achondrodystrophy, or finally a special dystrophy of unknown nature that partakes of the characteristics of both these affections.

In answer to a question regarding a history of the lesions of the central nervous system, the author stated that only in the second case the mother insisted that there were certain febrile phenomena accompanied by an encephalitis that had preceded the appearance of the osseous dystrophy.

5. Dr. Alessandro Guaccero (Sienna): *Tenotomy and Surgical Repair of Tendons with a View to Lengthening and Transplantation*. (An experimental study.) The author proposed to study: 1. Restoration of function in tendons lengthened by simple tenotomy and by plastic with long suture. 2. Trophic and structural modifications provoked by transplantation of a sound muscle on a tendon without function. 3. The adhesive processes in the various methods of union in the transplantation of the muscle directly onto the bone.

As a result of his diligent experimental researches he comes to the following conclusions: Tenotomy almost always puts long muscles out of commission by separation or want of anatomical reconstruction. With lengthening by splitting and folding back, though one secures continuity of the tendon it is at the expense and loss of its own substance, this method is replaced with advantage by suture at a distance, interposing silk cords. Lengthening by splitting and folding back is indicated only in retractions or old muscular contractions, in bending of the limbs—feet especially—when the integrity in the continuity of the tendons opposes itself to the reduction. Suture of tendon on tendon for transplantation has given the author good results in diverse conditions. He believes the fear to be an exaggerated one, that the transfer of the tendon of a paralyzed muscle to a sound muscle will cause it to give way or to lengthen, since he has seen the peripheral tendon modify and reinforce itself in adaptation to its new function. Finally, he declared his belief in nailing the transplanted tendon for simplicity and solidity. He was able to establish clinically and experimentally the value of this method.

6. Prof. Riccardo Dalla Vedova (Rome): *Concerning a Case of Bilateral Cervical Ribs*. In the case of bilateral cervical ribs that were resected on

the right side on account of the serious compression on the plexus and especially on the artery, the radiographic examination demonstrated in addition to this morphological variation of the seventh vertebra that there existed also a variation of the nineteenth vertebra. The author argued, from the observation in question, the corrections of the interpretations of Garré of Helbing concerning the so-called "scoliosis from the cervical rib," and, in conclusion, accepted the opinion of Drehmann, that the scoliosis accompanying cervical ribs can be interpreted as congenital scoliosis.

Dr. Vittorio Putti (Bologna) said he had radiographed some cases of cervical ribs with and without scoliosis; that if this existed it was always connected with congenital malformation of the vertebra in the cervical dorsal region.

7. Dr. Vincenzo Nicoletti (Rome): *Latest Contribution to the Origin of the So-called "Postural Scoliosis."* Asymmetrical variations of the vertebrae.

8. Dr. Vincenzo Nicoletti (Rome): *Contribution to Conservative Surgery of the Limbs.* A crushed and lacerated forearm saved by wiring bones and plastic muscle and skin suture.

9. Dr. Emilio Casalicchio (Bologna): *A Free Moving Body in the Elbow-joint.*

10. Dr. Roberto Alessandri (Rome): *Iliac Dislocation and Fracture of the Neck of the Femur with New Joint and Fungous Synovitis.* The author relates the case coming to him by chance in a young woman who, in February, 1907, reported a traumatic lesion of the left hip of doubtful diagnosis at first, and when he examined the patient in March, 1908, there was a posterior dislocation—variety iliac. There was no rotation of the limb, which, notwithstanding visible shortening, could be said to be in normal position. The radiograph showed evident displacement of the head, abnormal relation between the head and the diaphysis, and the formation of a new joint. After treatment with prolonged extension and fruitless attempts at bloodless reduction, the patient was operated on and they found an arthritis deformans with abundant fibrocartilaginous vegetations as well as a healed fracture of the neck with callus deformity. Resection of the deformed head was done with excision as complete as possible of the new joint and vegetations. The operative result was good, though later, on beginning to walk about, which for the left limb would have been quite possible, the patient began to complain of distress and pain in the *right* hip. Objectively there was rough friction in this joint and the radiograph showed a slight deformity of the femoral head and fringes on the margin of the cartilage that could be interpreted as intraarticular new-growth. It is probable, therefore, that the same process began of itself in the symmetrical uninjured joint. According to the author, this case that contributes to the knowledge of youthful forms of arthritis deformans, tends to confirm their *nervous* origin, as claimed by some authors. Finally, the author made some remarks on trauma as a cause of morbid conditions. Prof. Galeazzi considers the communication important and proposes to give results of his own researches into this obscure subject to the Italian Surgical Society (Soc. Ital. di Chir.).

11. Dr. Vittorio Putti (Bologna): *On the Deformity of 'Madelung.'* (An anatomical study.) The author showed a fine anatomical preparation of the deformity in question, to demonstrate that the conclusions which he had reached in regard to another case of the same malformation which he had studied clinically were well founded; that is, that the true deformity of Madelung proceeds from a partial lesion of the cartilage of the distal conjugation

of the radius, a fact now admitted by all, and demonstrated by the author, in 1906, by means of a series of radiographs. The mechanism of production of the deformity is not that admitted by most (the palmar flexion of the wrist on the radius), but on the contrary it is the result of movements on dorsal extension of the hands on the wrist. The author insists also on the importance of always distinguishing carefully the true deformity of Madelung from those deformities simulating it though not showing its etiological and pathogenetic factors.

In the discussion, Prof. Attio, of Naples, spoke of the deformities of the hands secondary to lesions of the central nervous system, especially infantile hemiplegia, and those of the wrist due to arthritis deformans. Prof. Clemente Romano believes that we ought to call deformities of Madelung *varus* and not *valgus*, having regard to the position in which we ordinarily consider the skeleton.

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At this point the assembly proceeded to the election of officers for the next Congress, and the following were chosen: *President*, Prof. Valentino Oliva; *Vice-President*, Prof. R. Dalla Vedova; *Secretary*, Dr. Vincenzo Nicoletti; *Vice-Secretary*, Dr. Vittorio Putti; *Treasurer*, Dr. Umberto Alezioni.

12. Dr. Vincenzo Neri (Bologna): *The Nervous Phenomena Following Unilateral and Bilateral Traction of the Femur*. (A clinical and experimental study.) It happens sometimes in orthopedics that the traction of the limb is followed by phenomena of paresis or paralysis of the same limb, and by phenomena of irritation of the opposite limb; that traction on both limbs, especially in certain subjects, provokes cerebral phenomena, delirium, convulsions, and, not infrequently, an epileptic state followed by death.

The author, presenting certain clinical observations, interpreted the above described phenomena by an experiment. Unilateral traction on the femur in a guinea-pig provokes, if mild, a paresis of the limb on which the traction is made, phenomena of irritation on the opposite side, and if prolonged causes complete paralysis of the thigh on the same side and transitory paralysis of the opposite side. Bilateral stretching of the thighs is followed by well-marked phenomena of cerebral irritation finally reaching a true epileptic state and sometimes death.

13. Dr. Gaetano Sangiorgi (Bologna): *Contribution to the Study of the Deformities Following Fractures of the Neck of the Femur within the Joint*. The author divides deformities following endocapsular fracture of the neck of the femur into three principal groups: (1) *Coxa vara*; (2) multiple deformities of the upper fragments analogous to arthritis deformans; (3) pseudoarthrosis. He says that the first two deformities belong to the youthful age in the period of growth, and that coxa vara can become apparent following trophic lesion of the upper fragment and subsequent curving of this. To the same alteration of growth in regard to the epiphyseal cartilage he attributes changes in the head of the femur analogous to those of arthritis deformans. He presented a variety of radiograms to show this. In regard to the pseudoarthrosis he takes into consideration the various therapeutic measures that have been proposed. He spoke of the bloodless methods recommended by Bardenheuer, Whitman, Moore, and others. He spoke also of the bloody method formerly used by ancients and restored to honor among the Americans. He referred to the excision of the upper fragment in cases where it is very small and where there is much pain. He holds the method of wiring to be not always certain, especially in cases of diminished osteogenetic activity of the fragments; and in cases of old pseudo-

arthrosis he advised the osteoplastic method of Codivilla, consisting in the transplanting on the neck of the femur a fragment of bone taken from the crest of the ilium, and kept alive by a long flap formed by the tensor of the fascia lata, reinforced by two strips of periosteum from iliac fossa applied to the line of fracture while the fragments are temporarily wired to secure coaptation.

14. Dr. Giovanni Impallomeni (Bologna): *On a Peculiar Anomaly of Development of the Right Leg.* The author referred to a case observed and studied in the Rizzoli Orthopedic Institute in which almost the whole of the distal epiphysis of the tibia, reduced to only the malleolar process was wanting. The fibula, on the contrary, which of itself had to provide for all the needs of weight-bearing, was enormously hypertrophied and compact in structure, as appeared from the radiogram copies which he exhibited. He described the morphologic variations of the lower portions of the bones of the leg, as due to the absence of the lower articulating surface of the tibia, and the consequent wedging of the astragalus between the two malleolar processes. In regard to the treatment he believes the only advisable means would be an arthrodesis, tibio-fibulo-astragalar, endeavoring in this operation to bring the extremity of the tibia in apposition with the upper surface of the astragalus.

15. Dr. Ignazio Berlucchi (Bologna): *Two Cases of Unilateral Femur Varus, Possibly Congenital.*

16. Prof. Giulio Anzilotti (Pisa): *Contribution to the Treatment of Malleolar Fractures of the Tibia and the Fibula.* In cases in which the radiograph shows very marked displacement of the fragments and the marginal fragments anterior or posterior, he believes that one can intervene by operation to effect reduction and metallic suture. He referred to three personal cases operated with signal success, emphasizing what he considers important, as ordinarily—and especially in nonrecent fracture—the reduction is difficult, and the rigidity of the tibio-fibulo-astragalar articulation is apt to follow, and also frequently reflex muscular atrophy. With operative interference, the ready displacement is hindered, mobilization can be prompt, and exercises to prevent stiffness of the joint and muscular atrophy can be begun in good season. The author cautioned against the indiscriminate use of this method, and it should never be used without the most scrupulous asepsis.

In discussion Prof. R. Galeazzi (Milan) said that Anzilotti probably meant to say supramalleolar fractures instead of malleolar, otherwise he could not agree with his view tending to popularize operative interference in the treatment of endoarticular fractures, which he considers very dangerous. But even in regard to comminutive fractures of the bones of the leg, he does not see how open treatment will facilitate reduction, which cannot be made by subcutaneous traction. He thinks the indications for open operation and suture exceptional, and recalls the service which the method of Codivilla can render in manipulations tending to reduce the displacement.

17. Prof. R. Galeazzi (Milan): *New Operative Method for the Treatment of Rachitic Genu Valgum.* After showing the reasonableness and the efficacy of forcible correction in knock-knee of adolescents, the author discussed the disadvantages of this method hitherto as applied to rachitic knock-knees, and which he seeks to obviate with his operation. This consists: 1. Of a plastic of one part of the tendon of the biceps to reconstitute the external lateral ligament after the correction. 2. Of the lengthening of the remainder of the biceps tendon. 3. Of the open transverse section of all the aponeurotic layers of the region external to the knee (fascia-lata, external lateral ligament,

tendon of the insertion of the external gemellus, the lateral ligament of the patella, the capsule of the joint) leaving the synovial membrane intact. The operation is only a preparatory stage for the graded correction of Wolff. The author demonstrated sufficiently satisfactory results with photographs before and after the treatment.

In the discussion, Prof. A. Curcio (Naples) inquired certain details of the after-treatment and its duration, as it seemed to him too long to be truly useful. While praising the mild operation of Prof. Galeazzi, he thinks forcible correction with or without cutting to be always preferable. Dr. V. Putti (Bologna) does not believe the operation of Prof. Galeazzi to be wholly without danger, as the author affirms, and contends that the better operative treatment, the more simple, the more rapid, and the less dangerous, is the subcutaneous osteotomoclasis of Lorenz.

18. Prof. R. Galeazzi (Milan): *Contribution to the Treatment of Paralytic Pes Cavus*. He showed the difficulties one encounters in the treatment of such a deformity, and described briefly his personal technic, after having explained his modification of the apparatus of Stillé, which he presented. Then he summarized the operative measures supplementary to the correction (multiple tenotomy, myotomy, arthrotomy, etc.). The author then passed on to describe his line of treatment in that form of "pes calcaneus sensu strictiori" in which there exists a modification in the form and in the axis of the os calcis, in which he obtains very good results by osteotomy of the os calcis combined with tendon transplantations on this, using a special technic. He advised, finally, the arthrodesis of the mediotarsal articulations in the form of pes cavus with toe-drop, and showed photographs and radiographs of cases before and after operation.

In discussion Prof. M. Säläghi (Florence) asked Prof. Galeazzi whether in cases of pes cavus following paresis of the muscles of the anteroexternal quarter of the leg he has found sufficient—for correcting the deformity—the open section of the contracted soft parts at the internal side of the sole, including the tendon of the long flexor of the great toe? In a child of six or seven years Säläghi obtained by this means a very good result.

19. Dr. Francesco Pantoli (Bologna): *On Exostoses of the Os Calcis*. Because of recent publications on this subject, the author presents two cases of exostosis of the os calcis occurring in two young persons suffering from multiple arthritis, due in one to hereditary arthritis and in the other to gonococcus infection. In both they were painful, and the pain occurred at the typical point beneath the tuberosity of the os calcis. Both had flat-foot. After having demonstrated by radiographs the pathological origin of such exostoses, he goes on to consider the treatment. This consists in their complete excision together with the periosteum and the neighboring soft parts, sparing neither muscle nor ligament to avoid recurrence.

20. Prof. R. Giani (Rome): *The Anterior Tibial Muscle and the Pathogenesis of Static Flat-foot*. The author, in course of important anatomical researches on three hundred feet, has studied especially the method of distribution of the tendon of the anterior tibial muscle to base of the first metatarsal and to the first cuneiform in order to confirm what he has already affirmed in his previous publication (*Zeitschrift für Orthopäd. Chirurg.*, Bd. XIV), the importance of the anterior tibial muscle itself in the genesis of static flat-foot. In the three hundred feet studied by the author, the attachment of the tendon of the anterior tibial to the first metatarsal was reduced in five to slender tabs, and in twenty-five to the proportion of one to ten with respect to the insertion on the first cuneiform. In about half of these cases

the foot appeared to be normal in conformation, the other half showed a tendency to flatness, in some cases complete. Such a condition was never found by the author in all the other observations in which the feet showed the insertion of the anterior tibial as normal. The author, though not affirming precisely that the adducted position of the front of the foot is due exclusively to the action of the anterior tibial, and to the distribution of the insertion of its tendon, shows plainly how the results of his recent researches accord with what he first maintained, and how one ought to attribute to the action of the anterior tibial muscle, associated with that of others, a position not to be overlooked among the etiological factors of static flat-foot.

In discussion Prof. M. Sälghi (Florence) held that the contribution that Prof. Giani brings to the etiology of flat-foot is particularly timely and pleasing, especially as neither the theory of Duchenne, of Boulogne (paralysis of the long lateral peroneal), nor that of Lorenz (rotation of the internal face of the foot on the external), nor that of Kirmisson (gradual relaxation of the plantar calcaneoscapoid ligament) serves to explain all the cases of flat-foot in adolescents.

21. Dr. Umberto Alegiani (Rome): *An Inexpensive Machine for Universal Movements*. The author takes the idea from the communication made by Dr. Mandelli to the Third Congress of the Italian Orthopedic Society, in which he considered the method of home treatment substituting for costly apparatus a machine of wood with accessories of metal. Such a pendulum machine serves for active as well as for passive movements.

THE ACADEMY OF MEDICINE, NEW YORK CITY, ORTHOPEDIC SECTION, MARCH 18, 1908.

The Orthopedic Section of the New York Academy of Medicine met December 18, 1908, and the following papers were read:

I. Pott's Disease of Cervical Spine, Complicated by Fracture Dislocation. A case. By Fred H. Albee, M. D.

II. Papers:

a. Plaster-of-Paris Treatment of Talipes Equinovarus. By Edward L. Barnett, M. D.

b. Mechano-therapy in the Treatment of Flat-foot. By Charles H. Jaeger, M. D.

c. Practical Deductions Regarding Flat-foot. By Carl R. Keppler, M. D.

A general discussion followed by Drs. Myers, Cilley, Nathan, Stronskie, and Arnold.

Dr. Charles H. Jaeger was elected chairman.

Dr. Fred H. Albee was re-elected secretary.

WHAT BECOMES OF OUR CRIPPLES?

At a meeting held under the auspices of the Orthopedic Section of the New York Academy of Medicine on March 18, the consideration of "What becomes of our cripples?" was the subject of three papers, one by Dr. DeForest Willard, of Philadelphia, the second by Mr. Persons, of the New York Charity organization, and the third by Dr. Jaeger, descriptive of the German method of insuring against accident and disability. The meeting was largely attended both by men interested in the orthopedic phases of the subject and by those interested in social service of various kinds.

Dr. Willard's paper described the Widener foundation of Philadelphia. Ten years ago, largely through the suggestion of Dr. DeForest Willard, Mr. Widener was induced to appropriate a sum of one million dollars for the purchase of thirty acres of land in the suburbs of Philadelphia and the erection thereon of buildings appropriate for the hospital care, manual training, and housing of crippled children. Having done this he has endowed the institution with three million dollars. Cripples are admitted to the institution without distinction of color, creed, or the nature of the trouble which has produced their crippled condition. Those mentally defective are not taken. They are kept until they are twenty-one years of age and possibly longer. They must be permanent cripples. The intent of the founder was not in any way to conflict with the duties of hospitals.

When first admitted the patients are taken into an isolation ward where they are kept until there is no question of contagious disease. They are then transferred to the hospital department where they are provided with whatever apparatus may be necessary to meet the conditions of the individual case. As soon as their physical condition has been satisfactorily attended to and it has been demonstrated that they are capable of undertaking school work, they are taken into the graded educational department of the home. The classes are arranged in exactly the same manner as are the grades in the public schools of Philadelphia. Comparatively few of the children progress beyond the grammar grades. As soon as they are old enough to undertake manual training, it is commenced.

About one-third of the pupils are girls and about two-thirds are boys.

In the manual training department carpentry, cane-seating, cobbling, gardening, floriculture, and engraving are taught to the boys, and sewing, cane-seating, housekeeping, laundry work, and dressmaking, together with many other allied subjects are taught to the girls.

As soon as they are able to earn anything by their work a market is sought for the product of their industry and they are paid for such part of their work as is in excess of the cost of materials. In this way the children are taught self-reliance. The children are encouraged to save out of their income so that they may have upon discharge from the home something to fall back upon. One pupil in the school now has already something like a hundred dollars. These sums are put out at compound interest, and by the time the children leave the institution they may have a considerable sum of money saved.

The institution expects to erect on the grounds a permanent home for its graduates. This will be built when there have been enough graduated from the school to justify it. The idea of this is that many individuals who sever their connection with the school because they are more or less self-supporting will doubtless find it necessary to have some place to go either on account of illness or slackness in their employment, and their crippled condition will always act somewhat as a handicap to them and will probably not allow them to lay up much for a rainy day, though it may take care of them when actually at work. At the home they will be boarded at a minimal rate; for example, if they are earning five dollars a week only, they would be boarded at the permanent home for perhaps one dollar a week. In other words, in proportion to their earnings their board will be charged.

At the present time the inmates of the institution are not permitted to go home. They are taken in on an indenture signed by the parents, which binds them to the institution for the years between ten and twenty-one.

One of the most satisfactory outcomes of the work has been that it has been possible to do a great deal of missionary work in this way through the

example of the school in other parts of the country and in remote parts of the world.

Mr. Persons, of the New York Charity Organization Society, states that there were no adequate facilities existing in New York City for the care of crippled children. In fifteen months there were fifteen hundred and eighty-three arrests made by the officers of the Charity Organization Society, and of these seven hundred and one were physically defective. Four hundred of these were cripples. The Charity Organization Society, of course, only arrests the mendicant cripples, and this doubtless does not represent the number of cripples who belong in the criminal class, and therefore does not represent the proportion of cripples among those who are non-supporting. The Charity Organization Society finds that the solution of the problems in connection with obtaining employment for the crippled is one of the hardest questions with which it has to deal. Much special effort has to be made before the cripple can be adjusted to a satisfactory employment. A new bureau in connection with the Charity Organization Society has been organized, the purpose of which is the relief of the handicapped. To this bureau two hundred and sixty-four applications have been made during the short time in which it has been active. Practically the only kind of employment which there is any prospect of getting the cripples engaged in is along unskilled lines. If the crippled were specially trained there would be less difficulty in procuring employment for them, as there is no difficulty in getting work for the blind or deaf mutes who are trained to skilled employments. The Charity Organization Society estimates that there are twenty-seven hundred cripples of school age in New York City alone. Some estimates place this number higher. He believes that special education, and this necessitates schools with special equipment, is the greatest need at the present time in the preparation of the crippled class for obtaining employment in industries where they would be self-supporting. He has found great difficulty in securing nurses and teachers for this class of cases.

Dr. Jaeger presented the third paper of the evening, in which he reviewed the industrial insurance regulations operative in Germany, also accident insurance. He called attention to the large number of Zander institutes at present in Germany, where the injured might receive treatment which would enable them to be restored to activity much more rapidly than is possible under ordinary conditions. There are one thousand of these institutes in Germany, and three hundred and fifty thousand patients are receiving treatment at these institutes each year.

Dr. Gibney reviewed the efforts which had been made at the New York Hospital for the Ruptured and Crippled in an educational way, and referred to the plans which had been made for carrying on manual training as a feature of that institution.

Dr. Janeway stated that only twenty-seven persons could be found who, having graduated from the schools for cripples in New York City in the past twelve to fifteen years, had become self-supporting.

The value of such statistics was later somewhat impeached by Dr. Wallace, who called attention to the difficulty in locating persons of this class, who so frequently move about, and he thought it was not fair to judge of the results of the schools in operation in New York from statistics obtainable by reference to patients' or pupils' addresses.

Dr. Wallace described briefly the effort which was being made to provide manual training and graded-school education for the crippled children of the East Side of New York in one of the schools in that section. He said that

there were ten schools of this character, with five hundred and sixty-four children, carrying on this work in the city of New York at the present time.

BOSTON ORTHOPEDIC CLUB.

Meeting of January 27, 1909.

Dr. R. B. Osgood reported upon two cases of nonfatal fracture dislocation of the upper two cervical vertebræ. He described in detail the anatomy of these vertebræ, their peculiarities in structure and mobility. An abstract of a case reported in a recent number of the *Ztschr. f. orth. Chir.* was given and the two cases personally observed by Dr. Osgood were described. In one of these after prolonged attempts at relieving the painful symptoms from which the patient was suffering by means of fixation, an operation was performed, at which the odontoid process was anchored to the posterior neural arch of the atlas by a silk suture, since which time he has had no symptoms, though the deformity due to the rotatory dislocation is as great as ever.

A number of cases were reported in brief by Dr. F. J. Cotton, Dr. R. Hammond, and others in the course of the discussion.

The next paper was by Dr. A. G. Cook, of Hartford, on "The Question of Balance." This discussed primarily the importance of muscle balance in the maintenance of a proper poise of the body. The paper was abundantly illustrated by photographs and diagrams.

The Boston Orthopedic Club met Wednesday, December 23, 1908.

Dr. J. E. Goldthwait read a paper on "A Case of Gastro-mesenteric Ileus Occurring During the Application of a Plaster-of-Paris Spica after Gant's Osteotomy," and also a paper on "An Obstinate Case of Writer's Cramp."

Dr. J. S. Stone read a paper on "Some Points on Bone Regeneration."

Following this, Dr. Adams read "A Preliminary Report of Congenital Deformities of the Vertebræ Causing Scoliosis."

NOTICES.

The information given below may be of interest and help to any of our members who are contemplating a trip to Europe this summer. Not all the orthopedic clinics by any means are indicated here, but replies to many of the inquiries sent out by the Editorial Board did not come in until it was too late to publish them in the May number of the JOURNAL.

The JOURNAL will endeavor to keep information of this nature before its readers in the future so that anyone may ascertain where orthopedic instruction may be had at any time during the year.

FOREIGN CLINICS. SUMMER AND FALL COURSES.

Royal National Orthopedic Hospital, 234 Great Portland Street, London, England.

Monday,	10.30—Mr. Muirhead Little.—Operations.
	1.30—Mr. Laming Evans.—Out-Patients.
Tuesday,	2.00—Mr. Openshaw.—Out-Patients.
	4.30—Mr. Openshaw.—Operations.
	2.00—Mr. Jackson Clarke.—Out-Patients.
Wednesday,	2.00—Mr. Little.—Out-Patients.
Thursday,	2.00—Mr. Tubby.—Out-Patients.
	4.00—Mr. Tubby.—Operations.
Friday,	1.30—Mr. Evans.—Out-Patients.
	3.30—Mr. Clarke.—Operations.

Royal Southern Hospital, Liverpool, England.

Wednesday, 2.00—Mr. Robert Jones.—Operations.

Saturday, 3.00—Mr. Robert Jones.—Out-Patients.

Heidelberg.

Professor Vulpius.—Surgical and mechanical Orthopedics, including massage and medical gymnastics. Semester, two hours weekly.

Würzburg.

Prof. J. Riedinger.—Fractures and Luxations. Semester, twice weekly. Medical gymnastics and massage. Semester, once weekly.

Dresden.

Dr. A. Schanz.—Bächnitzstrasse 13.

October, three weeks (daily?). 1. Orthopedics. 2. Massage.

Physicians are welcome any time.

Bonn.

No orthopedics in summer semester.

Dr. Machol (Surgical Clinic).—Fractures and dislocations.

October. Dr. Machol.—Four times weekly. Selected chapters in orthopedics.

Orthopedic lectures, courses, demonstrations, etc. (Germany, Austria, Switzerland) during the months of April to October, 1909.

Munich.

Prof. Dr. Lange. May 1 to August 1.

1. Course in orthopedic surgery (one hour per week, with demonstrations); Surgical Clinic of the University; public (*i.e.*, gratis).

2. Orthopedic out-patient treatment (three hours per week); Surgical clinic of the University; public.

3. Orthopedic operations (four hours per week); Rothes Kreuz Hospital; public. Dr. von Bayer: Selected chapters in orthopedic surgery with massage. Saturday from 9-10.

Zürich.

Orthopedic Institute, Dr. Schulthess and Lünig, Neumünster Allee, 3.

1. Dr. Lünig, The orthopedic affections of the hip-joint.

2. Dr. Schulthess, Special physiology of movements.

Breslau.

Prof. Dr. Ludloff. May 1 to August 1.

1. Fractures and displacements, with practical demonstrations, three hours per week.

2. Selected chapters of orthopedics, two hours per week.

3. Daily, nine to twelve, forenoon, orthopedic out-patient; examination of patients of the laborers' insurance.

4. If sufficient men take part, private courses in orthopedic surgery. Not in Breslau: August till the end of September.

Berlin.

Prof. Dr. Joachimsthal. May 1 to August 1.

1. Orthopedic surgery and technics with practical demonstrations, Mondays and Thursdays, 1 to 2.30 P. M.

2. Surgical and orthopedic bandaging; fractures and displacement, Thursdays and Fridays, 1 to 2 P. M.

3. "Unfallheilkunde," Saturdays, 1 to 2 P. M.

4. Medical gymnastics and massage, Wednesdays, 1 to 2 P. M.; University Poliklinik for Orthopedic Surgery, Luisen Str., 3.

Prof. Dr. Gluck. May 1 to August 1.

Surgery and orthopedic surgery of children, Mondays and Thursdays, 1.30 to 3 P. M.

Prof. Dr. Schütz, Wilhelm Str., 92. May 1 to August 1.

1. Mechanotherapeutics; practical and theoretical course. Saturdays, 2 to 4 P. M.
2. Monthly course in medical gymnastics and massage. Tuesdays, Thursdays, and Saturdays, 6 to 7 P. M.

Privatdocent Dr. Wollenberg, Karl Str., 39. May 1 to August 1.

1. Orthopedic surgery. Tuesdays and Fridays, 6 to 7 P. M. 30 Marks.
2. Methods, indications, and results of orthopedic operations. Thursdays, 6 to 7 P. M. Gratis.
3. Pathology, x-ray diagnosis, and treatment of chronic joint diseases. By appointment.

Dr. Böhm, Wilhelm Str., 43.

1. General etiology of deformities; course in orthopedic scientific work. By appointment.
2. Monthly courses in medical gymnastics and massage. By appointment.
3. Course in orthopedic Hessing-Therapy. By appointment.

Cologne.

Prof. Dr. Bardenheuer. Course about fractures and dislocations with special reference of his extension method, in October.

Prof. Dr. Cramer. Lectures on orthopedic surgery, in October.

Vienna.

Prof. Dr. A. Lorenz. There will be courses through the whole year held by Prof. Lorenz and his three assistants Dr. Aberle, Dr. Werndorff and Dr. Sage, on orthopedic surgery; diagnostic courses and operations—courses on the cadaver. Dr. Werndorff gives his lectures through the whole year in the English language. Orthopedic surgery, dissecting work on the cadaver and x-ray work "in bone and joint diseases."

THE SECOND COMPETITION FOR THE HUMBERT I. PRIZE.

The Orthopedic Institute Rizzoli in Bologna has announced the second competition for the Humbert I. prize, offered for the best orthopedic work or invention. The competition opened the first of January, 1909, and will close the last of December, 1909. The prize, which is offered every five years, amounts to 3500 lire. Foreign, as well as Italian, physicians may compete, and notes may be written in Italian, French, German, or English. The material presented must be either new or must have been published within the five years preceding the closing of the competition. More detailed information may be obtained by application to the Editorial Committee.

MEETING OF THE AMERICAN ORTHOPEDIC ASSOCIATION.

The twenty-third annual meeting of the American Orthopedic Association will be held at Hartford, Connecticut, on June 14, 15, and 16, 1909. On the previous Saturday there will be clinics given in Boston, to which all interested are cordially invited. Sunday intervening will give opportunity for leisurely travel to Hartford. There will be scientific sessions, two per day, on Monday and Tuesday, and one on Wednesday. The programme cannot be announced as the JOURNAL goes to press.

The President of the Association this year is Dr. A. G. Cook, of 179 Allyn Street, Hartford, Conn., and the Secretary is Dr. Robert B. Osgood, of 372 Marlborough Street, Boston, Mass.

ABSTRACTS.

I. TUBERCULOUS LESIONS OF BONES, JOINTS AND TENDONS. GENERAL ARTICLES ON TUBERCULOSIS.

Du thymol camphre comme agent de fonte des fongosités tuberculeuses. Risacher. Abstracted in Zentralbl. f. chir. u. mech. Orth., Sept., 1908, p. 409.

The Conservative Treatment of Tuberculous Joints. Harold A. Pingree. Trans. of the Maine Med. Association, Vol. XVI, Part II, 1908, p. 383.

Die Behandlung der Kniegelenktuberkulose in der königl. chirurg. Klinik zu Berlin von 1888-1903. Kantor. Dissert. Berlin, 1908. Abstracted in Zentralbl. f. chir. u. mech. Orth., July, 1908, p. 321.

Surgical Tuberculosis. B. Poulton. Intercolonial Med. Jour. of Australasia, October, 1908.

Abscess Between the Iliopsoas Muscle and the Head of the Femur. R. H. Russell. Abstracted in Journal A. M. A., Dec. 19, 1908, p. 2191.

La mort subite dans le mal de Pott. L. Gauthier. Abstracted in Zentralbl. f. chir. u. mech. Orth., November, 1908, p. 505.

Ein Fall von sklerosierender Osteomyelitis. Blencke. Abstracted in Ztschr. f. orth. Chir., 1908, XXI Bd., 4 H., p. 614.

Psoas Abscess Cured by Posterior Operation. James K. Young.

Trans. Phil. Acad. of Surgery, June 1, 1908. Reported in Annals of Surgery, November, 1908, p. 788.

Traitement de la tuberculose osseuse avec les injections locales de tuberculine Béraneck. W. de Coulon. Abstracted in Ztschr. f. orth. Chir., 1908, XXI Bd., 4 H., p. 625.

De la pigmentation au soleil des membres atteints d'affections tuberculeuses. Delmont-Bébet. Abstracted in Ztschr. f. orth. Chir., 1908, XXI Bd., 4 H., p. 626.

Tuberculose inflammatoire de l'aponéurose palmaire. Horand. Abstracted in Ztschr. f. orth. Chir., 1908, XXI Bd., 4 H., p. 652.

The Ocular Reaction to Tuberculin. Oscar H. Wilson. Journal A. M. A., Nov. 28, 1908, p. 1836.

Correction d'une ankylose du genou en flexion á angle droit par l'ostéotomie double, oblique de Krukenberg. Nové-Josserand. Abstracted in Ztschr. f. orth. Chir., 1908, XXI Bd., 4 H., p. 667.

Marmorek's Tuberculous Serum in the Therapy of Surgical Tuberculosis.

By M. Strauss, Heidelberg. *Deutsche mediz. Wochenschrift*, April 9, 1908, p. 675.

Conclusions.—Marmorek's tuberculosis antitoxin serum given by the rectum, may be used without any harm. In a series of cases specific effects seem to be present, similiar to those produced by hygienic methods. Essential to the treatment is a period of time long enough to make the passive immunity as intensive as possible. In widespread cases the effect seems much more uncertain, but trials should be made.—*H. Bucholz, Boston.*

Double Hip Disease.—A case by Vinguard. *Surgical Review*, 1908.

Thighs and knees flexed and both legs abducted and crossed. Five years' duration. Child bed-ridden.

Tenotomies of the fascia lata and hamstrings were done and limbs put up in plaster.

In four months there was no improvement and a Lorenz osteotomy of the femur was done on one side and two months later on the other. The child is now able to walk.—*W. G. Turner*.

Hypertrophic Osteoarthritis of Tubercular Origin Occurring in Man and in the Dog. By V. Ball and H. Alamartine. *Surgical Review*, Paris, October, 1900.

They show the bones of the pelvis, lower leg, and of the foot from a dog three years old which died and showed multiple arthritis and hypertrophic modules on all bones and chronic bronchopneumonia with chronic pleurisy; the lobes were honeycombed. No T. B. found.

This case is supposed to be one illustrative of those tubercular pulmonary osteoarthritis. The syndrome of Marie's. The authors discuss it at length and conjure it with the cases described by Marie in human beings, deciding the disease to be the same in the dog.—*W. G. Turner*.

Significance of the Conjunctival Reaction as a Method of Diagnosis.

By L. Hans. *Wiener klin. Wochenschrift*, 1908, Vol. XXI, No. 32, p. 1155.

The conjunctival reaction is a method of diagnosis which it is the duty of a physician to apply in cases of suspected tuberculosis, and is to be preferred to other methods of injecting tuberculin.

The conjunctival reaction differs from the subcutaneous injection of Koch, in that there is no general disturbance (the absence of fever is particularly marked), but at the same time there is no local reaction to show the seat of the lesion.

The reaction begins after from four to ten hours.

With a positive reaction the chances are nine to one in favor of the presence of tuberculosis.

Completely encapsulated or healed processes, sometimes perfectly healthy people, may give the so-called late reaction, which appears after twenty-four hours. In healthy individuals the reaction may occur after psychic or physical disturbances.

The reaction reaches its highest point in from twenty-four to forty-eight hours, and usually lasts from four to six days, sometimes from ten to fourteen days, and in one case it continued through six weeks.

In five cases phlyctenular conjunctivitis resulted from the injections and in one case parenchymatous keratitis lasting six weeks, so that the process is shown to be not without danger. After repeated injections in the same eye the intensity of the reaction may increase, but this occurrence is not constant.

On the whole, the clinical value of the conjunctival reaction is doubtful, for it may appear without evidence of tuberculosis, and may be absent when tuberculosis is present.—*Emma Lootz Erving, Washington*.

Concerning the Conjunctival Tuberculin Reaction. By A. Krokiewicz. *Wiener klin. Wochenschrift*, 1908. Vol. XXI, No. 32, p. 1149.

In a well-ordered article the author tabulates the results of his investigation into the efficacy of the reaction in various diseases and concludes:

The value of the reaction in pulmonary tuberculosis is uncertain both as regards diagnosis and prognosis. On the other hand, in primary disease of

the intestines and abdominal lymph glands it is often of the greatest value in determining a doubtful diagnosis. In tuberculosis of the peritoneum the reaction was positive in 83 per cent.; in tuberculosis of the bones and joints in 87.5 per cent.

The reaction is frequently positive in cases that on section are shown to be free from tuberculosis. In one case dying of septicemia, two of typhoid, two of croupous pneumonia, and two of degeneration of the heart muscle due to general atheroma, all of which were shown at autopsy to be free from tuberculosis, the reaction was positive.

The reaction may also occur in the course of acute infections where tuberculosis can almost certainly be excluded, as in the later stages of typhoid (41.6 per cent.), acute articular rheumatism (50 per cent.), influenza (3 per cent.), and in croupous pneumonia (16.2 per cent.)

The reaction was positive where there were no clinical symptoms of tuberculosis in five cases of brain and cord lesions resulting from syphilis, in one case of traumatic myelitis, two cases of high-grade anemia, one case of Hodgkin's disease, and two cases of diabetes. In gastric carcinoma the reaction was positive in 10.7 per cent. after repeated trials, but in most cases no results followed repeated injections. In diseases of the liver the reaction did not occur except in the presence of tuberculous lymph glands. In two cases of uremia with no tuberculosis discernable, the reaction was positive.

Stronger or weaker reactions may be considered to show corresponding powers of reaction in the patient, so that a very strong reaction has a favorable prognostic significance. Tuberculosis in its final stages and miliary tuberculosis show no reaction.

Objectively the reaction is a catarrh of the mucous membrane of the eye with a reddening of the caruncle lasting a few days; subjectively there is a sensation of swelling and discomfort of the lids, as in the case of foreign body. Fever practically never occurs.

Chronic catarrh of the connective tissue is no contraindication.

Absolute contraindications are all severe inflammations of the eye, especially of the inner eye.

Repeated injections into the same eye are to be avoided.—*Emma Lootz Erving, Washington.*

Ocular Tuberculin Reaction. By A. Plessi and C. Tossati. *Gazz. degli Ospedali e delle Cliniche*, 1908, Vol. XXIX, No. 92, p. 975.

Basing their conclusions on the results obtained in sixty-six cases, the writers conclude that the reaction is specific for tuberculosis and is a valuable aid in diagnosis.

A positive reaction indicates that there is a focus of tuberculosis present in the patient without, however, giving any positive information as to the nature of any local condition from which he may be suffering, and in this respect does not give as much assistance as the subcutaneous injection.

A negative reaction does not positively exclude the presence of tuberculosis.

The test is simple and generally harmless, but the marked eye reactions occurring in a few cases suggest prudence in its application.—*William G. Erving, Washington.*

Experimental Ocular Tuberculin Reaction. By V. Maragliano and G. Romanelli. *Gazz. degli Ospedali e delle Cliniche*, 1908, Vol. XXIX, No. 101, p. 1065.

The writers investigated the subject along the following lines:

1. Injections in fifty-five hospital cases known to be suffering from tuber-

culous lesions of various organs, chiefly bronchopulmonary. In these the reaction was positive in but 27.4 per cent. and intense in less than half of these.

Repeated injections and increasing the dosage up to a drop of 4 per cent. solution failed to increase the percentage. The reaction usually occurred in twelve hours and continued from six hours to six days. They believe that in advanced cases of tuberculosis the reaction is often negative.

2. Injection of animals which had been previously inoculated intravenously with living tubercle bacilli, and which gave physical signs and symptoms of infection. In these cases, which included six monkeys, twelve rabbits, and twelve guinea-pigs, the results were clearly negative.

3. Animals previously immunized by subcutaneous injections of dead bacilli. These cases, comprising two monkeys, sixteen rabbits, and ten guinea-pigs, were all negative.

4. Four animals immunized and later inoculated with living bacilli. All negative.

5. Sixteen hospital cases convalescing from acute nontubercular diseases, vaccinated against tuberculosis by inoculation. In these injection both before and after vaccination was negative.

In rabbits and guinea-pigs they found the conjunctiva very sensitive to chemical stimulus, and as they responded negatively to the Calmette reaction, they believe this reaction does not depend on the direct stimulus of the conjunctiva by the toxin.

They also found that they could partly neutralize the action of tuberculin by adding to it a specific antitoxin at the time of injection. Also that the mixing of tuberculin with blood-serum of a positively reacting tuberculous patient they could not form a specific substance which on injection into eye of a well subject would give a positive reaction.—*William G. Erving, Washington.*

Further Report on the Conjunctival Reaction in Tuberculosis. By R. Fabian and H. Knopf. *Berl. klin. Wochenschrift*, 1908, Vol. XLV, No. 37, p. 1565.

The authors report the results obtained in 150 cases.

In fifty-one supposedly nontuberculous cases, 1.9 per cent. were positive.

In fifty-seven suspected tuberculous cases, 38.5 per cent. were positive.

In forty-two tuberculous cases, 92.8 per cent. were positive.

In two cases of typhoid, in which there were no signs of tuberculosis one case was positive and one negative.

In eight cases of acute articular rheumatism, in which other observers have often had a positive reaction, their results were uniformly negative.

In advanced stages of tuberculosis, shortly before death, the reaction was negative.

In an improvement in such a case, the reaction may change to positive.

The authors conclude that the conjunctival reaction is not a sure guide in prognosis. A positive reaction shows a strong probability of tuberculosis, but a negative reaction does not exclude the presence of disease.

The authors have never had any bad results in the injections and place a high value on the method.—*Emma Lootz Erving, Washington.*

Primary Tuberculosis of the Mesenteric Glands. Report of Infections with Bacilli of the Human Type. By Alfred F. Hess, M. D. *The American Journal of the Medical Sciences*, August, 1908.

The author reviews all of the instances in which tubercle bacilli have been found, cultivated and differentiated in the mesenteric glands.

The frequency of primary infection of the mesenteric glands varies greatly. The English statistics showing 18.6 per cent. out of 1560 autopsies, whereas in a series of 369 cases about New York there was the low percentage of 1.3. In all there have been seventy-one instances of primary mesenteric infection with a complete report, forty-four or 62 per cent. of which were of bovine variety; fifty-nine of the seventy-one cases were children, and of these forty-one or 69.5 per cent. were of the bovine type, whereas of the twelve adult cases only three or 25 per cent. were instances of bovine infections.

There seems to be little if any difference in the course of the disease in the two types of infection so far as can be determined, and limitation and healing is possible.

The preponderance of the bovine type in children has led many to believe that milk is the great source of infection.

Hess reports three cases, two in children, all of which showed the human type of infection in contrast to the seventy-one cases reviewed.—*John Dunlop, Washington, D. C.*

Campodactyly. By Milan and Crepin. *Gaz. des Hôp.*, 1908, No. 5, p. 53

By this name the authors refer to a permanent and irreducible flexion of one of more fingers, due to retraction of flexor tendons, without any joint involvement. They believe the condition is generally due to tuberculous sclerosis of the tendons. One hundred subjects with this deformity were taken at random; ninety-four had demonstrable tuberculous lesions; six were probably tuberculous. These lesions were of a very chronic nature—adenitis, lupus, healed osteitis, etc. Campodactyly is therefore to be considered a true stigma of tuberculosis, and is of diagnostic and prognostic importance.—*Roades Fayerweather, Baltimore.*

Double Coxalgia. By Guillaume-Louis and J. Calvé. *Gaz. des Hôp.* Nos. 124 and 126, 1908.

An interesting study concerned chiefly with the various deformities and characteristic gaits in cases of double hip disease. Much of the article is quoted from Ménard, whose classification of these deformities is strictly followed. Illustrated with cuts and with graphic records of the gaits in certain types. Contains nothing new.

The Ophthalmotuberculin Test. By Drs. McKee, R. P. Campbell, and White. *Montreal Medical Journal*, October, 1908.

Gives the literature for and against the use of this test. The writers say "we have had an opportunity of following the test here and have found it, on the whole, reliable and free from danger. Our experience has been wholly with cases with normal eyes." "In the normal conjunctival sacs of adults, uniformly satisfactory results from a diagnostic point of view may be obtained."

In reviewing this article, however, one cannot allow it to pass without saying that their test is comparatively useless in the diagnosis of lesions in bones and joints. A positive reaction does not indicate that the disease of the bone or joint in question is tuberculous, but only that the patient has probably some tuberculous focus. On the other hand, as Baer has pointed out, we can make a positive diagnosis of the existence of tuberculosis in a bone or joint by the hypodermic injection of tuberculin, this being followed by a local reaction in the part in question.—*A. Mackenzie Forbes.*

Primary Tuberculosis of the Intervertebral Disk. By Beneke. *Münch med. Woch.*, 1908, No. 20.

Findings in a case in which death resulted from tubercular meningitis. Caries of several dorsal and lumbar vertebræ with psoas abscess. Author states that the localization of the infection pointed to a primary disease of the interarticular fibrocartilage with secondary disease of the adjoining bone. Apparently there had been a traumatic spondylitis deformans and the tubercular process attacked the primarily-diseased fibrocartilage.

Experiences in the Treatment of Spondylitic Kyphosis According to Calot. By Hofmann. *Zeit. für orth. Chir.*, XXII Band, 1-3 Heft, 1908.

New methods of treatment of this deformity are constantly coming up. Some of them, however, are so complicated that only a limited number of specialists can apply them. Practicability and simplicity are just as necessary for orthopedic diseases as for others. The method of Calot is simple and safe. It requires no set of instruments. The whole apparatus of Calot consists in an extension sling for the head and a wheeled saddle-chair for patient with paresis. According to the author's experience, the question of proper treatment of these deformities has been solved by Calot. There is nothing especially new in the paper.—*Henry O. Feiss, Cleveland, O.*

The Question of Tuberculous Changes Produced Without the Action of Tubercle Bacilli.—By Liebermeister. *Münch. med. Woch.*, No. 36, Sept. 8, 1908.

This is a discussion of Zieler's researches which have recently been opened up. These researches showed that even without the presence of corpuscular parts of the tubercle bacilli, namely, by the pure solution alone of material coming from the tubercle bacilli, the histological picture of tuberculosis may be brought about.

This discussion is of no special orthopedic interest.—*Henry O. Feiss, Cleveland, O.*

Ophthalmos Reaction in Tuberculosis.—By Wiens and Günther. *Münch. med. Woch.*, Sept. 8, 1908. LV, No. 36.

The author reports on 409 cases, concluding as follows: "The application of the ophthalmos reaction is not useful in practice because, on the one hand, its results are not certain and, on the other, because we cannot prevent severe reactions." In the clinic it may be used to support other methods of investigation." *Henry O. Feiss, Cleveland, O.*

II. PARALYTIC DISEASES AND THEIR DEFORMITIES. TENDON SURGERY.

Tendon Transplantation for Talipes Valgus. James K. Young. *Trans. Phil. Acad. of Surgery*, June 1, 1908. Reported in *Annals of Surgery*, November, 1908, p. 788.

Ulcera perforante del piede da spina bifida occulta. Un caso di guarigione colla neurotomia dello sciatico. Sertoli. Abstracted in *Zentralbl. f. chir. u. mech. Orth.*, Sept., 1908, p. 434.

Ematoma traumatico diffuso al terzo superiore dell'avambraccio destro. Produzione di un'estesa massa fibrosa includente muscoli e nervi. Paralisi dei nervi mediano, radiale e cubitale. U. Trinci. Abstracted in *Zentralbl. f. chir. u. mech. Orth.*, October, 1908, p. 460.

Schwere Kinderlähmung. Mayer. Abstracted in *Zentralbl. f. chir. u. mech. Orth.*, Dec., 1908, p. 543.

Transplantation of Muscles. Demonstration of Two Cases.—By Deutschlaender, Hamburg. *Muench. med. Wochenschr.*, 1908, p. 2694.

CASE I.—Five-year-old girl with paralysis of gluteus medius and minimus. To compensate for these muscles a bundle of the gluteus maximus was separated, twisted through 90° and fixed on the anterior superior spine of the pelvis.

CASE II.—Eight-year-old girl with congenital elevation of scapula and other anomalies of development. After removing the upper angle of the scapula, which was bent inward, and mobilizing the scapula with the knife a part of the pectoralis major was separated and fixed on the lower angle of the scapula in order to support the weak serratus anticus.—*H. Bucholz, Boston.*

Success in the Treatment of Grave Infantile Paralysis.—By O. Vulpus, Heidelberg. *Muench. med. Wochenschr.*, 1908, p. 2662.

Vulpus demonstrates twelve cases of much extended infantile paralysis, which he has treated by a combination of operations: Myo- and tenotomies, osteotomies, arthrodesis, transplantations of muscles and tendons, redressments, excision of bones, etc. Several of his patients who were only able to move themselves by means of their arms were finally able to walk upright. Vulpus acknowledges the advantages of portative apparatus but emphasizes the value of operation wherever it is possible. He thinks no case is too severe not to be benefited more by operative treatment than by fixation in apparatus only.—*B. Bucholz, Boston.*

Nerve Transplantation.—By Kuettner, Breslau. *Deutsche med. Wochenschr.*, 1908, p. 2196.

After excision of a neuroma of the nervus medianus a part of the tibialis and peroneus from a leg amputated at the same time was transplanted. Recovery.—*H. Bucholz.*

Case of Muscular Dystrophy Following Acute Poliomyelitis in Infancy.

By S. D. Ingham. *Archives of Diagnosis*, New York, July, 1908, Vol. I, No. 3, page 269.

The evidences of the previous disease and the signs and symptoms of the muscular dystrophy are given in detail. Differential diagnosis from a spinal cord disease is made. Author states that the latter may be related to a previous acute poliomyelitis, but such a relationship not evident between a dystrophy and poliomyelitis. He thinks that since poliomyelitis is an infectious disease the sequence of the two diseases in this case "suggestive from the standpoint of pathogenesis."

It is advantageous to have such cases recorded, but it may be doubted if the premises warrant the conclusion of even suggestiveness.—*W. G. Turner.*

Dangerous Consequences of Ocular Tuberculin Reaction. By P. Schrupf. *Münch. med. Woch.*, Oct. 27, 1908, LV., No. 43.

Without disputing the value of the reaction, author warns against its frequent use and reports two cases in aged women in which not only very serious local consequences (almost total blindness in one case) followed its use, but in which the general conditions were unfavorably affected. Conclusion: The test should only be used with the greatest care and then only after warning patient of its possible consequences.—*G. I. Bauman.*

A New Operative Method of Treatment of Spastic Paralysis by Means of Resection of the Posterior Spinal Nerve-roots. By Foster
Zeit. für orth. Chir., XXII Band, 1-3 Heft, 1908.

This paper is of considerable importance, at least from a neurological point of view. The basis of the operation is the fact that in spastic paralysis we have a pathologic intensification of the reflexes originating in a sensory irritation from the skin, joints, ligaments, and especially from the muscles. Such impulses pass from the posterior nerve-roots into the gray matter and thence into the anterior horns, and the reflex is completed through the motor nerves into the muscles. Through such a reflex the limbs are fixed in their position and the muscles resist stretching. It is present in the normal, but in the normal the fixation reflex is less marked because the cortex continuously exerts a restrictive influence upon spinal reflexibility through its pyramidal tracts. If through disease of the pyramidal tracts this influence is inhibited, then the spinal reflexibility reaches the extreme degree which it inherently had. On these premises, it would seem that we could suspend the spastic contracture if we divide a link in the chain of the reflex arc. In the peripheral nerves, the motory and sensory fibers are mingled. The spinal cord itself is an inoperative field. There remains the posterior nerve-roots. This interesting hypothesis was tested by Prof. Tietze in four cases. In the first case there was a congenital bilateral defect of the upper third of the central convolution, *i. e.*, both cortical leg centers, resulting in an unusually severe paraplegia. The result showed disappearance of contractures and about normal passive movability. The boy learned to stand and to walk a little. It is too early to report final results.

The second case was one of Pott's disease of the cervical vertebræ with marked deformity. The result was not as good as the first case. The third case was one of spastic paraplegia (Little's disease) also operated with improvement. In the fourth case an unfortunate injury was done to the cauda equina causing a motor paralysis and death.

The technic of the operation is briefly given. It consists of a laminectomy of the second to fifth lumbar vertebræ and the beginning of the sacral lamina, and opening of the dura and resection of the proper nerve roots.

This paper is pregnant with possibilities. Of course the question is whether we are justified in doing a radical and dangerous operation on cases where cure is out of the question, because if the lesion lies in the higher centers the improvement gained by the operation cannot be radical. Therefore, the older operations on the peripheral muscles would seem more logical at present. In the light of Sherrington's work, experiments on animals could easily be carried out testing Forster's ideas without experimenting on human beings.—*Henry O. Feiss, Cleveland, O.*

The Technic of Arthrodesis Operations. By Bade. *Zeit. für Orth.*, XXII Band, 1-3 Heft, 1908.

The general considerations are, first, proper asepsis and, second, the proper approximation of the bones. With regard to the knee, we should avoid shortening as much as possible, limiting ourselves simply to a removal of cartilage and taking off as little bone as possible. In the foot complete ankylosis is not necessary. He even favors a small amount of mobility because the gait becomes better and more elastic. The arc of motion must, however, not be sufficient to permit the foot to drop back into equinus (not more than twenty degrees). He also gives some attention to the shoulder and hip and other

joints. The article contains nothing of special note and is consistent with the technic of other men.—*Henry O. Feiss, Cleveland, O.*

III. INFECTIOUS ARTHRITIS.

Case of Pneumococcus Arthritis. G. S. Mathews. *Providence Med. Jour.*, November, 1908.

A Case of Spondylitis Anchylopoetica Following Meningitis Epidemica. By Landwehr. *Muenchener Medizinische Wochenschrift*, 19. Mai, 1908, p. 1104.

Report of the Case.—Boy of fifteen years. Present state, Kyphosis of lumbar and lower dorsal spine with some limitation of motion; no latera curvature. Walking now about normal. The course of the disease was a typical one, without any complications in the internal organs. Treated with serum. Very painful exudative arthritis of the knees, feet, and elbows for about three weeks. The kyphosis was found in the sixth week and was progressing. Therapy: Hot air, extension, active gymnastics, massage. The whole aspect reminded one of a gonorrheic spondylitis. X-ray picture showed the contours of the intervertebral joints not distinct; transparency of the articular processes. No focus like that in tuberculosis.

Landwehr supposes that while the large joints healed with good motion the smaller joint of the spine became ankylosed by the long rest. This case is the only one in the literature with such an etiology.—*H. Bucholz, Boston.*

Gonorrheal Arthritis. By Bauman. *Ohio State Medical Journal*, 1908.

This article is a summary of the modern ideas with regard to this affection. The etiology, bacteriology, onset, diagnosis, and treatment are reviewed. Author believes that any arthritis appearing during or closely following a gonorrheal affection, particularly with severe pain and moderate temperature may be considered gonorrheal. The prognosis with proper treatment is usually that of cure.—*Henry O. Feiss, Cleveland, O.*

IV. INFECTIOUS BONE DISEASE, INCLUDING SYPHILIS.

Ein Fall von kongenitaler Syphilis. Noesske. Abstracted in *Ztschr. f. orth. Chir.*, 1908, XXI Bd., 4 H., p. 610.

Traitement de l'osteomyélite aiguë du tiers supérieur du fémur par la résection de la hanche. Pauchet. Abstracted in *Ztschr. f. orth. Chir.*, 1908, XXI. Bd., 4 H., p. 657.

Tabes and General Paralysis in Children from Acquired Syphilis. By Apert, Lévy, Fraenkel and Ménard. *Archiv. de Méd. d. Enfants*, 1908, No. 7.

Report of a case, a girl, who at age of two and one-half years had acquired syphilis, and at 15 years presented a combination of tabes and general paralysis.—*Roades Fayerweather, Baltimore.*

Synovitis of the Knee-joint as a Late Manifestation of Acquired Syphilis. Report of a Case. By Isaac Levin, M. D., New York. *Medical Record*, Nov. 14, 1908.

Dr. Levin briefly and systematically enumerates the various joint affections which may occur at each stage of syphilis. The earliest joint symptom of acquired syphilis is the "arthralgia," it is unaccompanied by any anatomical joint lesion, and usually appears with the fever and roseola;

the characteristic of this pain is that it comes at night. Early in the secondary stage may be found a subacute synovitis resembling both gonorrheal and polyarticular arthritis, while later in this stage may appear chronic synovitis or hydrarthrosis. This, if treated, heals without impairing joint function, as it affects only the serous layer. The tertiary lesions, perisynovitis gummosa, and chondroarthritis gummosa, are destructive and impair function. In congenital syphilis, in addition to any of the above, we may find the "deforming arthritis" of Mericamp, manifested by enlarged epiphyses, impaired joint function, without effusion.

The author describes a case of a woman who, having acquired syphilis in infancy from a wet-nurse, showed, at thirty-five years of age, a hydrarthrosis of the left knee-joint, which yielded readily to mercury and iodids. The mildness of the affection at so late a stage he attributes to the probable attenuation of the infection. In closing the writer says, "When the joint disease is the only manifestation of syphilis and there are no other symptoms, the nocturnal exacerbation of the pain is in itself a sufficient indication of the true etiology. But even in the absence of this pain, in every case of chronic hydrarthrosis of unknown origin that does not respond to the usual treatment, syphilis ought to be considered."—C. W. Hoyt, Rochester, N. Y.

Reconstruction of the Lower Two-thirds of the Tibia after Necrosis by Osteomyelitis.—By Lapeyre. *Revue de Chirurgie*, 1908. Vol. XXXVII, No. 1, p. 97. (Reported from the Société de Chirurgie de Paris).

Patient five and one-half years old. Entered hospital twenty-fifth day of disease, with high fever and large abscess.

Operations.—Lower third of diaphyses opened and guttered and epiphyses invaded by curette.

Result.—Fever fell, but local suppuration persisted. Tibia necrosed to just below tubercle. Second operation, two months after the first, a sequestrum thirteen centimeters in length removed. Limb placed in plaster. Two months later the tibiotarsal articulation became involved and was drained. Seven months later patient left the hospital walking with a silicate protection apparatus. Two months after discharge tibia perfectly regenerated with some curvature.

Broca suggested that the second sequestrotomy had been performed too soon as total sequestration is not accomplished for three or four months.—W. G. Turner.

The Value of the Wassermann Reaction in the Differential Diagnosis of Syphilis. By Fischer, Berlin. *Klin. Wochenschrift*, 1908, Vol. XLV, No. 4.

As a result of clinical investigation in the Virchow Hospital, the author draws the following conclusions:

1. The reaction is clinically specific for syphilis, as it is found only in syphilis.
2. It is of value as a means of constitutional, not as an organic diagnosis, and from it the nature of the pathological lesion in any particular organ cannot be determined.
3. A positive reaction only is valuable. A negative reaction does not prove the absence of the disease, much less that an old lesion is healed.
4. No conclusions are reached regarding the influence of therapy on the reaction.—William G. Erving, Washington.

V. METABOLIC DISTURBANCES CAUSING BONE AND JOINT DISEASE.

Case of Osteitis Deformans. S. White. British Med. Journal, Dec. 5, 1908.

Ueber die Beziehungen des Knochenmarkes zum neugebildeten, kalklosen Knochengewebe bei Rachitis. Oehme. Abstracted in Ztschr. f. orth. Chir., 1908, XXI Bd., 4 H., p. 598.

Ricerche sul ricambio materiale in casi di osteoartrite deformante giovanile dell'anca. Palagi. Reported in Ztschr. f. orth. Chir., 1908, XXI Bd., 4 H., p. 621.

Another Case of Osteomalacia Cured by Suprarenalin Injections.

By G. Rocchino. *Policlinico, Roma, Sez. prat.*, 1908, Vol. XV, No. 28.

Report of a case of osteomalacia in a woman of twenty-two, who had been married ten years and had borne five healthy children. Preceding the birth of the last child, one year previously, she had noticed first weakness of the legs, which was followed by pain in the legs and trunk, and increasing disability, until she was unable to stand or walk without assistance.

Examination showed much tenderness on palpation, especially over the pelvic, and quantities of phosphates in the urine. No deformities had taken place.

Her stay in the hospital was necessarily limited to two weeks, during which time adrenalin solution was injected hypodermically once daily, in amounts of $\frac{1}{4}$ mg. shortly increased to $\frac{1}{2}$ mg. (Bossi's method). Improvement was immediate and upon leaving the hospital she could walk, go up and down stairs, dress herself, and do many other things previously impossible, all without pain.

Notwithstanding the fact that on her return home the treatment was but imperfectly carried out, improvement continued, and upon examination, 40 days later, no symptoms could be elicited on palpation save slight tenderness on pressure over sacrum and coccyx. She was actively engaged in her business and considered herself again well. The only symptom was slight coccygeal pain on sitting.—*William G. Erving, Washington.*

The Question of the Etiology and Treatment of Myositis Ossificans Traumatica. By Bocker. *Zeit für orth. Chir.*, XXII Band, 1-3 Heft, 1908.

Author distinguishes three types: 1. Myositis ossificans progressiva which is constitutional and attacks the whole skeletal system. 2. Myositis ossificans circumscripta which results from repeated traumatic irritation. This type was explained in the peculiar predilection of muscle tissue to produce bone. 3. Myositis ossificans traumatica in the narrower sense or so-called traumatic intramuscular osteoma which is evoked by a single trauma.

A short review of the literature with a report of a case where the condition took place in the elbow. This article contains nothing new except the description of the case.—*Henry O. Feiss, Cleveland, O.*

The Cause of Arthritis Deformans in the Experiment. By G. A. Wollenberg. *Centralblatt für Chirurgie*, 1908, p. 1470.

Each disturbance of the nutrition of joints due to a serious trouble of the arterial or venous circulation during a long period may be the cause of arthritis deformans. W. made experiments on this basis: He interrupted the circulation of the capsule of the patella of dogs. After one-half year he saw an enormous arthritis deformans of the joint between the patella and the femur.

VI. BONE AND JOINT TUMOR, BENIGN AND MALIGNANT; EXOSTOSES, ETC.

Abgekapselte subkutane Fibrome an Hand und Fuss. Jakobsthal. Abstracted in Zentralbl. f. chir. u. mech. Orth., November, 1908, p. 527.

Sarcoma sottodurale cervico-dorsale. Dalla Vedova. Abstracted in Zentralbl. f. chir. u. mech. Orth., November, 1908, p. 530.

Totalexstirpation der Clavicula. Jordan. Abstracted in Zentralbl. f. chir. u. mech. Orth., July, 1908, p. 339.

Ueber hereditäre, multiple, kartilaginäre Exostosen. Pannenberg. Dissert. Greifswald, 1908. Abstracted in Zentralbl. f. chir. u. mech. Orth., Sept., 1908, p. 396.

Multiple Enchondrome. Preleitner. Abstracted in Zentralbl. f. chir. u. mech. Orth., Dec., 1908., p. 553.

On Osseous New-growths at the Elbow Following Backward Dislocation of the Radius and Ulna. D. Grieg. Abstracted in Boston Med. and Surg. Jour., Dec. 3, 1908, p. 774.

Multiple Osteoidchondrom des Skeletts. Konjetzny. Abstracted in Zentralbl. f. chir. u. mech. Orth., October, 1908, p. 474.

Fibrolipoma of Synovial Folds of Knee-joint. James K. Young. Trans. of Phil. Acad. of Surgery, June 1, 1908. Reported in Annals of Surgery, November, 1908, p. 787.

Exostosis Cartilaginea Multiplex. By Minkel. *Deutsche. med. Wochenschrift*, No. 21, 1908.

At a meeting of the "Aerztliche Verein," at Frankfort a. M., March, 1908, Minkel presented a patient, a boy seven years of age, who developed an exostosis on the left little finger at the age of two months. In the course of the following year twenty-five such exostoses developed in different parts of the skeleton, the largest on the right shoulder girdle. The radiograph showed several which were not palpable. The child has remained stunted in growth. No hereditary tendencies or stigmata exist.—*Alexander E. Horwitz, St. Louis.*

Giant-cell Sarcoma of the Forearm. By Alfred C. Wood, M. D., Philadelphia, Pa. *Annals of Surgery*, January, 1909.

Report of such a case occurring in a colored woman twenty-six years of age. Patient gave a history of injury to the arm, said to be a fracture, followed by an operation for "necrosis" of the bone. The tumor was a sloughing mass 19 by 7 cm. in diameter. Patient was anemic from repeated hemorrhages. Disarticulation was done at the elbow under local anesthesia. Patient left the hospital sixteen days after operation with a good stump. No later report on patient's condition is given. Pathological diagnosis, giant-cell sarcoma. The article is well illustrated.—*R. R. Fitch, Rochester, N. Y.*

Bone Transplantation after Resection on Account of Bone Cyst. By Perthes. *Munch. med. Woch.*, 1908, No. 26.

Report of Case.—Boy, age twelve. On account of bone cysts the upper half of humerus was resected and replaced by a piece of the tibia with periosteum attached.

Result.—Firm union of the two in six weeks and a very satisfactory functional result.

The Question of Multiple Sarcomatosis in Youthful Bone and of Ostitis Fibrosa. Recklinghausen. By Werndorff. *Zeit. für orth. Chir.*, XXII Band, 1-3 Heft, 1908.

The author does not go deeply into the literature, but describes a case of multiple sarcomatosis and gives some of the essential points from the clinical,

pathologic-anatomical point of view, referring to the three symptoms—fractures, osteomalacia, and the formation of tumors. The radiographic investigation of the case shows cystic changes in the right pelvis and on various places in the right upper and lower leg, which findings are characteristic. The distinction as to whether this case is a primary skeleton disease or osteomalacia in the sense of von Recklinghausen can only be decided by microscopic investigation. This investigation showed the presence of giant-cell sarcoma and other characteristic points.—*Henry O. Feiss, Cleveland, O.*

VII. SCOLIOSIS AND STATIC DISTURBANCES.

Deviation de l'omoplate en dedans (scapulum valgum). Nageotte-Wilbouchewitch. Abstracted in *Zentralbl. f. chir. u. mech. Orth.*, July, 1908, p. 339.

Cinq cas de scoliose hystérique chez des adolescents. Nageotte-Wilbouchewitch. Abstracted in *Zentralbl. f. chir. u. mech. Orth.*, July, 1908, p. 337.

Der Lendenschwinger, ein neuer Skoliosenpendelapparat. Wilhelm Becker. *Ztschr. f. orth. Chir.*, 1908, XXI Bd., 4 H., p. 572.

The Question of Traumatic Flat-foot. By Deutschlander. *Zeit. für orth. Chir.*, XXII Band, 1-3 Heft, 1908.

By traumatic flat-foot we usually mean a badly healed malleolar or supra-malleolar abduction fracture. In the present article the author refers to a common group of cases clinically distinct from the above where there is a history of an unimportant trauma with severe disturbance of function and disability in the gait. The character of the pain is that of flat-foot but even after years have passed there is no change in the arch noticeable. In this whole group of cases the author says there is an injury to the Chopart's joint manifested on the Rentgen picture but only apparent on close and careful scrutiny of the picture. In the treatment he lays emphasis on mobilization and alleviation of the stiffening of Chopart's joint, in systematic exercises in strengthening the musculature and hot-air hyperemia. In connection with these things he uses an insole and has a special leaning to Whitman's plate. There is undoubtedly considerable justice in Deutschlander's observation and it is impossible to lay too much stress on the carefulness with which plates ought to be scrutinized.—*Henry O. Feiss, Cleveland, O.*

Results of Correction in Severe Scoliosis. By Schanz. *Zeit. für orth. Chir.*, XXII Band, 1-3 Heft, 1908.

The author says that even if he has been pleased with previous results of redressment, such treatment is by no means completely satisfactory, especially in certain cases. He describes a reclination bed and a stretching apparatus. Both of these are quite complicated. The results shown in the pictures are apparently good, but, of course, the evidence so obtained can never be convincing. At the end of this demonstration, the author admits that scoliosis is the most difficulty deformity to correct. He believes, however that by keeping at it and gaining a little at a time, more will be achieved. The least improvement that is obtained has at least the value of inciting one to further efforts.—*Henry O. Feiss, Cleveland, O.*

Deviations in the Spine with Lumbosacral Fusion Vertebrae. By Cramer. *Zeit für orth. Chir.*, XXII Band, 1-3 Heft, 1908.

Author alludes to the lack of reference in the orthopedic literature to these anomalies and briefly runs over the other literature. He describes preparations from the anatomical department in Marburg. Most of these show fusion of one side or the other of the lowest lumbar vertebrae to the sacrum

and sometimes fusion of both sides. This paper of interest with reference to Böhm's work.—*Henry O. Feiss, Cleveland, O.*

Flat-foot Disability and its Treatment. By Mayer. *Münch. med. Woch.*, 1908, 3, p. 144. Abstracted in *Zentralbl. f. chir. u. mech. Orth.*, Aug., 1908, p. 385.

Author describes the localization of a disability in flat-foot, saying that it appears in all parts of the arch. but that it may also extend over the whole lower extremity. A number of disease pictures like achillo dynia, metatarsalgia and others may be in close causal connection with flat-foot. Flat-foot is due to a misrelation between the static requirements and static load-carrying ability. In the treatment of the rigid type, plasters, insoles, massage, and gymnastics are used.—*Henry O. Feiss, Cleveland, O.*

What are we to expect from Modern Treatment of Scoliosis? By Wahl. *Münch. med. Woch.*, July 14, 1908, LV, No. 28.

The literature of orthopedics says too little about the results of treatment in scoliosis. A great advance is that there is to-day considerable agreement about its principles. With regard to gymnastic exercises the results in flexible cases are good and cures undoubted. With regard to the fixed cases, the thing which seems more certain to-day is that the exercises must be given in larger doses than formerly. His experience covers some three hundred odd cases. In connection with his work he uses a reclination bed on which the patient lies at night. This bed has already been described in the *Zeitschrift* and has been previously abstracted.—*Henry O. Feiss, Cleveland, O.*

Investigations Concerning Habitual Scoliosis. By E. Kirsch. *Arch. f. Orthop., Mech. u. Unfallchir.* Bd. VII, H. 1.

Kirsch examined 1000 school children in 1907 to investigate the following points:

1. The cause of habitual scoliosis.

2. Prognosis—which of the many forms are progressive. After a review of some of the modern theories of the causes of static scoliosis he takes up the question of what constitutes a "fixation of the spine" in scoliosis. Torsion and fixation can only be spoken of in a clinical and not in an anatomic sense. In a fixed spine we find

1. That the frontal or saggital assymetry persists in forward bending of the spine.

2. It persists when the head is flexed to a maximum.

3. It cannot be corrected by the hands when exerting proper pressure for correction.

4. Lateral bending is greater on the one side than on the other.

5. The presence of "torsion."

The results of other investigators along these lines are given with the criticism that they are not correct because the previous investigators did not properly strip the children. Kirsch strips the smaller children naked to the shoes and stockings and the older ones to the trochanters. He used no measuring or other instruments of precision.

Results of Examinations.

SIZE, PROFILE AND MUSCULAR DEVELOPMENT.

		Normal	Round	Flat	Hollow Shoulders.
Nonscoliotic	333,	63.5%	22.4%	12.2%	0.5%
Scoliotic	682,	53.7%	29.1%	15.7%	1.5%

The "flat back" was observed principally in unfixed cases. In the lower classes the proportion of nonscoliotic girls showing "flat back" was 8 per cent., which increased to 20 per cent. in the older classes, while among the boys the proportion decreased rapidly, showing the influence of the German gymnasium system.

DEVELOPMENT OF THE MUSCLES.				
	Strong Muscles	Medium strength	Weak muscles.	
Nonscoliotic, 409,	43.8%	40.3%	15.9%	
Scoliotic, 134,	25.4%	50.7%	23.9%	
	Number examined	Scoliosis	Nonfixed	Fixed.
Boys, lower classes,	237	19.0%	11.8%	7.2%
Higher classes,	281	21.4%	15.3%	6.0%
Total,	518	20.3%	13.7%	6.6%
Girls, lower classes,	256	21.9%	14.5%	7.4%
Higher classes,	241	41.1%	28.2%	12.9%
Total,	497	31.2%	21.1%	10.0%
Grand total,	1015	25.6%	17.3%	8.3%

Tables 223, which can best be studied in the original, give an excellent review of the location and degree of the scoliosis in the various classes. Of the side to which the deviation occurred the following table is given:

	Right	Left.
Boys,	15.2%	75.2%
Girls,	21.8%	70.0%

The influence of rickets which Kirsch discusses in the etiological introduction is taken up in his researches. He finds as the percentage of the pupils examined showing distinct signs of rickets to be:

Rickets in,	Non-Scoliotic	Scoliotic	Fixed form of Scoliosis.
Girls, lower classes,	56.0%	66.1%	65.0%
Girls, older classes,	12.5%	14.0%	17.4%
Boys, lower classes,	46.2%	51.7%	58.8%
Boys, older classes,	25.3%	62.2%	47.1%

The author who is practising in Magdeburg, a city of over 200,000 inhabitants, does not state from what schools or from what especial class of children the statistics are taken. The reviewer understands that the work was done in the public schools and inasmuch as simple computation would show that the figures mean 43.5 per cent. of all the children examined were rachitic, it would seem that there is either something preposterously wrong with the economic and social conditions of that prosperous city or there is something wrong with the author's findings. In either case the work is now laid open to the just criticism that it is not a fair statement of anything except strictly local conditions and worthless for general quotations and deductions.

Kirsch concludes that the influence of school life upon scoliosis is greatest upon girls with "nonfixed" forms of scoliosis which, as is seen from the

table, increased from 14.5 per cent. in the lower to 30 per cent. of the higher classes.

He denies that congenital anomalies of the spine cause as many cases as Böhm states; in fact, he claims that the real changes in many of Böhm's cases are merely old rachitic lesions, in others the whole affair is merely a coincidence because many cases of spinal variations have no scoliosis.

The chapter on treatment is not worthy of serious consideration.—*Walter G. Stern, Cleveland.*

Deformities of the Hips in Lumbar Scoliosis. By M. P. Desferres. *Medical Press*, Paris, August 15, 1908.

The author shows that in lumbar scoliosis the deformity also extends to the hip bones. The innominate bone of the convex side being shorter in both diameters. Cuts of twelve skeletons of adult scoliotics are shown. In some of the cases the atrophy involves the whole extremity. Dr. Max Böhm's very excellent article is quoted. The deformity occurs in all adult cases whether due to rachitic influences or numerical variations.—*W. G. Turner.*

The Mechanics of Lateral Curvature. By Henry O. Feiss. *Cleveland Medical Journal.*

Dr. Feiss has shown by means of a cleverly constructed mechanical model the result produced upon the vertebral column by the strains, communicated through the ribs, of side bending and of twisting and explains that the distortions of scoliosis are exactly those which would result from such strains when long continued.—*W. G. Turner.*

A Machine for the Forcible Correction of Deformed Feet. By Nutter. *Montreal Medical Journal*, February, 1908.

The author describes with illustrative sketch this apparatus. The leg is held by iron bar and straps down to the ankle-joint, and projecting below the joint. In this lower projection portion are a number of holes, into any one of which an upright pin may be inserted for counterpressure. Corrective force is applied by means of a long lever with a flange for pressure on the side of the foot; the proximal end of lever being inserted for stability into a hole according to adjustment in the heel-piece. The instrument is simple in action; and whether unnecessary trauma might be inflicted on the foot could only be judged by experience. It is well worthy of trial.—*W. G. Turner, Montreal.*

Scoliosis and Nutrition in the Case of Adolescents. By Hutinel. *Gaz. des Hôp.*, No. 12, 1908.

Hutinel believes that in the great majority of cases of scoliosis the essential, underlying defect is malnutrition, and cites four cases as illustrations. All were girls between 13 and 15 years old. All had slight curves, convex to right, showed slight albuminuria, poor digestion, and were otherwise below par. He has frequently observed in scoliotics many signs of functional disturbances, which, with the scoliosis, he believes attributable to malnutrition. Among these are the following: *Anemia*, *albuminuria*, of the orthostatic type, with probably no renal lesion whatever. In many cases it is never found, but it should be looked for; it is usually to be detected only in urine passed after the patient has been up and about. *Dyspnea* is frequent. There is often a vesicular murmur at the apices when standing, absent when lying down. This is probably due to a condition of general

enteroptosis, not to tuberculosis, causing a lowering of the diaphragm. *General enteroptosis. Nervous conditions.* Headaches are common and in girls the menses are often irregular. *Disordered digestion* is very common.

All these are manifestations or disordered nutrition, and as such, are particularly apt to appear at puberty, just as they do during pregnancy. At both of these periods there is a great demand on the bodily economy, more in the case of woman during puberty than in the case of man. Why this is we do not know, but it may help to explain the greater frequency of scoliosis in girls.

As to treatment, Hutinel recommends, above all, rest, to economize the strength. Massage, fresh air, simple, good diet, avoiding rich foods. Tonic and hygienic treatment, as indicated. *Gymnastics in moderation.*—*Roades Fayerweather, Baltimore.*

The Scoliosis of School Children. By F. Lagrange. *Archiv. de Méd. des Enfants*, 1908, No. 7.

In the absence of congenital, pathological, and other well-recognized causes, Lagrange believes the chief factor in producing scoliosis to be fatigue of the back muscles, resulting in the assuming of a position which, taken originally to relieve muscular strain, becomes habitual and finally, owing to structural changes, permanent. Such fatigue results more surely from prolonged standing and sitting than from active exercise, the muscles in the former cases being continuously in action to maintain the trunk erect. The position assumed to relieve this strain is, in standing, to throw the body-weight on one leg, slightly flexing the other; in sitting, to elevate the ischial tuberosity of one side, often by crossing one leg over the other. In either case the pelvis is tilted and the lumbar spine inclines to the lowered side—in nine cases out of ten to the left. The fact that all cases subjected to these same conditions of strain do not develop curvatures shows that individual predisposition also plays a part. This point the author promises to discuss in a further communication. It is obvious that the first aim of treatment should be to secure rest for the fatigued muscles. The giving of too vigorous exercises is accountable for much of our ill success with these cases. School children should not be required to remain sitting for long periods, and while sitting the back should be supported in such a way as to relieve the muscles without necessitating the resort to the "hipped" (*hanchée*) position.—*Roades Fayerweather, Baltimore.*

Hip Gymnastics. By P. Desposses. *Presse Médicale*, 1908, No. 75.

The title is misleading. The article contains nothing new, and comprises, for the most part, simple statements as to the action of muscles concerned in movements of the hip.

Congenital Scoliosis. Report of a Case. By H. Hudson. *International Clinics*, Vol. II, Eighteenth Series.

The author reports the history of a boy of six years who is sturdy and well formed except for a spinal deformity, though he seems a little undersized. There is no history of deformities in the family except that the child had a paternal grand uncle who was a hunchback. The defect in this case was first noticed when the boy was nine months old. Two months later he was first brought to consult a physician, by whom he was sent to the orthopedic department of the Jefferson Hospital, where apparatus was applied, and where he has been under observation ever since. In spite of pronounced curves in the cervical, dorsal, and lumbar regions, the boy has marked

flexibility of the spine. When the child was standing the right shoulder and scapula were two and one-half inches higher than the left. There was a pronounced torticollis. The coccyx was defectively formed. There was marked rotation. The x-rays show that the sixth and seventh cervical vertebræ are cleft, as are also the third, sixth, and tenth dorsal, the latter being very wedge-shaped. There is a rudimentary half vertebra between the ninth and tenth dorsal. There are six lumbar vertebræ and the last of these is attached to the ilium by a transverse process. There is also a difference in the appearance of the sacroiliac juncture as compared with the other side.

The alterations in the ribs were as follows: double cervical ribs articulating with the seventh cervical; the ribs attached to the fifth and sixth dorsal on the left side seem fused for a considerable distance and their heads are imperfectly developed; a fully formed rib joins the rudimentary half vertebra above described. This gives thirteen ribs on one side and fourteen on the other; there were thirteen thoracic vertebræ besides the rudimentary half vertebra. After describing in detail the anatomic peculiarities of this most interesting case, the author reviews quite fully the recent literature of spinal malformations, referring chiefly to the writings of Bernard Roth, Lovett, Colville, Whitman, Böhm, Dwight, Fischl, Bardeen, Schulthess, and Rokitsansky. The report is well illustrated by x-rays, tracings, and photographs, and gives the facts in sufficient detail. Enough of a bibliography is appended to guide one who cares to go further into the study of the relation of congenital vertebral defects to the production of scoliosis, a matter of great interest, and, as it now seems, likely to be of much moment in the future study of this common deformity.—*C. F. Painter, Boston.*

A New Form of Scoliometer. By Harry Hudson, M. D., Philadelphia. *International Clinics*, Vol. IV, Series 18.

The author, who is a demonstrator of orthopedic surgery in Jefferson Medical College, Philadelphia, presents a new instrument for recording lateral curvature. He quotes Hoffa, Bradford and Lovett, and Whitman to show the necessity of accurate measurements as a part of the study of cases of scoliosis, and the chief features which should be the subject of measurement. The well-known difficulties in obtaining such records are referred to, and in a chart he gives the various methods which have been employed, the details of application of these methods, and the names of the men who devised them. He classes the methods under six headings, viz.: 1. Measurement. 2. Delineation of contour alone or combined with measurements. 3. Perspective delineation. 4. Roentgen photography with or without a screen. 5. Plastic methods. 6. Systematic measurements of the physical dimensions.

The devices used to facilitate the making of these records vary all the way from the simple tin or lead strip of Roth to Schulthess' complicated projection apparatus. The names of Heinecke, Virchow, Mickulicz, Beeley, Bigg, Brodhurst, Barwell, Schulthess, and many others are associated with attempts to secure constantly satisfactory results in such mensuration methods.

The author does not claim that the apparatus he proposes for the purpose solves all the difficulties or yields perfect results. The principle employed is not unlike that which E. B. Young used in constructing his spinal tracer. A series of bars are so arranged that their points may be brought in contact with the chest wall at certain points located short distances apart. By recording the numbers of the bars on charting paper in a horizontal plane and the measurements in a vertical plane and connecting the points made by the

various bars it is possible to get a graphic representation of the chest in both the anteroposterior and lateral planes. The shape of the chest as would be seen in horizontal section may be obtained in this way at any level. The apparatus described and figured has the value that attaches to all such apparatus, viz.: it gives a fair representation of the deformities, which may be preserved in order to follow the gross changes in the deformity. It is impossible that any should be exact; it is possible to distort the readings, and therefore the interpretation of them, to a tremendous degree. Their taking may serve to keep some patients up to their work, and in a large clinic may be of service in the study of the tendencies of various types of deformity when observed *en masse*, provided one makes a large reduction for intrinsic errors. The apparatus suggested by Hudson seems to be one liable to as few errors as most of those already tried out, is fairly inexpensive, and would serve especially well, because of its ease of application, in a curvature clinic.—*C. F. Painter, Boston.*

VIII. CONGENITAL DEFECTS, INCLUDING CONGENITAL DISLOCATIONS.

Gut ausgebildete Halsrippen bei einem 17-jährigen Mädchen. Hilgenreiner. Abstracted in *Zentralbl. f. chir. u. mech. Orth.*, November, 1908, p. 529.

Ein Fall von kongenitaler Rotationsluxation beider Kniee. Helbing. Abstracted in *Zentralbl. f. chir. u. mech. Orth.*, November, 1908, p. 514.

The Treatment of Irreducible Congenital Luxations of the Hip by Operative Means. Gwilym G. Davis. *American Jour. of the Medical Sciences*, January, 1909, p. 37.

Su un caso di morbo di Dupuytren. Gianasso. Abstracted in *Ztschr. f. orth. Chir.*, 1908, XXI Bd., 4 H., p. 651.

Remarks on the Treatment of Congenital Dislocation of the Hip. By Reiner, Vienna. Abst. in *Central für chir. und mech. Orthop.*, 1908, 541.

Reiner explains nine-tenths of all relaxations by anteversion of the neck of the femur and emphasizes in such cases osteoclasis with secondary reposition after union of the bones. Reiner supposes that in the primary position (abduction in right angle) the neck of the femur tends to press upward and the head presses on the roof of the acetabulum. By these means a part of the roof will be used for formation of the cavity and even in the case of redislocation may occur. Therefore, it is not advisable to correct the anteversion after the reduction.—*H. Buchholz, Boston.*

A Contribution to the Theory of Coxa Valga with Special Reference of the So-called Coxa Valga Luxans. By J. Kumaris, Berlin. *Archiv. für klinische Chirurgie*, 1908, Vol. 87, p. 625.

Report of the literature in its historic development. Conclusion that the study is not yet thoroughly cleared up.

Etiology.—1. Traumatic, 2. Symptomatic, especially by lack of weight-bearing; 3. Rachitic. Many cases of this etiology are not coxa valga in a strict sense because the chief curvature is not in the neck but in the diaphysis of the femur. 4. Primary, *i.e.*, not any of the other causes.

Klapp has found that in many of these cases the acetabulum is affected too and he makes a distinction between collum valgum and real coxa valga. The majority of cases at the polyclinic in Berlin showed on the x-ray picture a marked enlargement of the cavity, which was more flat than normally; the head of the femur was not congruent to the cavity, but filled only the upper part and was in loose articulation with the cavity. These forms are called by Klapp coxa valga luxans. In the differential diagnosis must be considered tuberculosis and arthritis deformans.

The symptoms are abduction, outward rotation, limitation of adduction and pain, but the diagnosis cannot be made sure except by the *x-ray* picture. Low position of the trochanter major may be present, but in some cases when the cavity is much enlarged normal or even in a high position like in coxa vara it may occur.

The treatment consists in removing the causative factor as genu valgum, etc., Redressment or osteotomy may be done.—*H. Bucholz, Boston.*

Coxa Vara Congenita. By Elisabeth Rafilsohn. *Dissertation Freiberg*, 1908, Abstr. in *Centralblatt fuer. chir. und mech. Orth.*, 1908, p. 539.

Report upon two cases: The anamnesis and present state seem to prove that the etiology of both these cases indicated a congenital deformity of the neck of the femur. Such deformity has been developed by an internal cause, it means a defect of an embryonic rudiment. By this way the deformity of the neck of femur develops without any extended cause.—*H. Bucholz, Boston.*

Treatment of Congenital Dislocation of the Hip. By F. Barnes. *Brit. Jour. of Children's Diseases*, October, 1908.

Barnes in a brief way reviews the discovery and description of congenital dislocation of the hip by Dupuytren in 1826. At that time and for a long time after it was thought incurable. Then it was rarely discovered until the second deformities had become marked. He speaks of the first open joint operation done by Hoffa in 1890. This operative procedure gave a few good results, relapses were the rule, and if the hip remained reduced ankylosis frequently occurred. As a cause of the condition, it was at first supposed that the primary defect lay in the want of development of the acetabulum.

Heusner and Marcwald have shown from an examination of a large number of fetuses that the acetabulum is relatively shallow in fetal life.

In new-born children it covers a third of the head of the femur and when the child is five years of age one-half the head of the femur is covered by it. There has also been shown to exist a disproportionate laxity of the capsule in the female as regards the male. This condition probably accounts for the prevalence of the condition in females, 80 per cent. of the cases occurring in that sex.

After reduction by the Lorenz method the leg is put up in the now discarded frog position. This position is held for about two months and then the leg is gradually brought down, and the child allowed to walk. The after-treatment by means of plaster cases is usually kept up for twelve to eighteen months. Some cases he has wear a hip-splint for two or three years after operation.—*J. W. Sever.*

A New Treatment of Recurrent Dislocation of the Hip. By C. Nelaton.

The deformity appeared some day after an accident. In walking the hip stuck out at the level of the trochanter, accompanied by a cracking sound, the left leg straightened, the thigh rotated inward and there was pain. After an instant the pain ceased and the thigh slipped into place with a click.

Plaster was applied to prevent flexion, but when taken off in three months the difficulty returned.

Dr. Nelaton believed it an atypical partial dislocation and planned the operation as follows to prevent the internal rotation by fastening the trochanter near to the ischium. He took from out the sheath of the semitendinous a strip of fibers the size of the forefinger and about 25 cm. long, leaving them attached to ischium and then passed them under the glutius

maximus. The trochanter was then perforated by a hole and the cord of muscles drawn out through it was sewn to the peritoneum on the outside with catgut, the end being long enough to allow flexion, but prevent inward rotation. The result was excellent.—*W. G. Turner.*

Rational Treatment of Congenital Dislocation of the Hip. By P. Le Darnang.

The primary position of Lorenz, that is, 90 degrees of flexion and 90 of abduction, the lower leg in the longitudinal plane of body is advocated.

The author shows that in the congenital dislocations of young children this brings the head into the bottom of the acetabulum. That while in this position the pull of the muscles tends to correct the anterior twist of the femoral neck on the shaft and tends to pull the head up into the socket, thus forcing it deeper.

This pull of the groups of muscles from the pelvis to the femur is analyzed in these positions of flexion without abduction and in the flexion 90, abduction 90 and it is shown that marked reduction of either the right-angle flexion or 90 degrees of abduction puts the head into a much less stable position and one where the pull of the muscles tends to increase rather than diminish the anterior rotation of the femoral neck.

Cuts are also shown of ambulatory brace for maintaining the position. A very good article.—*W. G. Turner, M. D., Montreal.*

Treatment of Congenital Dislocation of the Hip. By Ducroquet. *Presse Médicale*, 1908, No. 82.

In posterior dislocations (the common form), chief obstacle to reduction is the hour-glass constriction of the elongated capsule. Redislocation, after reduction, is favored by the relaxation of the capsule and by the lack of adaptation, as to size and shape of the head to the acetabulum, disadvantages partially offset by the tension of the shortened muscles, which act as guy-ropes.

After reduction the position of greatest stability is abduction at a right angle with the body. Varying according to the degree of integrity of the acetabular rim, this angle may be reduced to a point of minimum stability beyond which redislocation will occur. For fixation a point midway between this maximum and minimum abduction should be chosen. In order that the imperfectly developed epiphysis of the head may be most perfectly apposed to the acetabulum, abduction should be accompanied by external or internal rotation, according to the degree of the abduction. These relationships of abduction and rotation the author has plotted out on a chart in the form of a curve. Abduction of 90 degrees requires outward rotation of 90 degrees; abduction of no degrees, inward rotation of 90 degrees; abduction of 60 degrees, a position midway between external and internal rotation. Ducroquet emphasizes the importance of consulting the graphic chart before applying fixation, because, as we have seen, the degree of abduction and of rotation do not bear a constant relationship to each other.

After maintaining the initial fixation for two or three months an actual fibrous ankylosis is generally found to have occurred, which it must be our next step to correct. Simple inspection does not reveal the usually extensive atrophy of bone and muscle, owing to which, care must be used not to bring the leg down too rapidly in the successive dressings. Instead of removing the entire cast each time a section may be removed between the groin and the mid thigh, and the two divisions thus left may be reunited by an overlaid plaster spica, after the new position has been secured.

The final position should be one of slight abduction and marked internal rotation, observing the harmony of relationship indicated in the graphic curve. Failure to observe this relationship of rotation to abduction is said by the author to be accountable for many of the mediocre results called by the Germans "anterior transpositions." Finally massage, and at last passive motions should be employed to break up the remains of the fibrous ankylosis.

The article contains illustrations showing anatomical relations, and also the plaster table devised by the author as a simple method for maintaining the patient in various positions while fixation is being applied.—*Roades Fayerweather.*

Congenital Ankylosis of the Proximal Ends of the Radius and Ulna.

By Pietro Bossi. Reviewed in the *Arch. f. Orthop., Mech. u. Unfallchir.*, Bd. VII, H. 1, p. 79.

In a lad of eight there was a bilateral congenital union between the radius and ulna of the elbow-joint. Extreme supination was impossible.

The bones were separated operatively and a muscle flap inserted between them; as the hand could not even then be supinated the radius was divided at its lower third and the hands fixed in extreme supination.

The result of this operation was excellent.

A second case is described in a boy of three.

Sixteen further cases are collected from medical literature and briefly described.—*Walter G. Stern, Cleveland, O.*

Congenital Dislocation of the Hip. A Collective Abstract of the Literature up to 1904. By Ferd Schultze. *Arch. f. Orthop., Mech. u. Unfallchir.*, Bd. VII, H. 1.

While the subject of congenital hip dislocation has received the attention of such medical authorities as Hippocrates, Galen, Avicenne, Pare, Paletta, Dupuytren, Pravaz and countless others, epoch-making contributions have come only from Hoffa, Paci, and Lorenz.

I. Etiology and Frequency.

Hippocrates lays it to intrauterine trauma while Pare says "those who limp beget their like, not only often but almost always." The main theories concerning the etiology are summed up by the reviewer as follows: Excessive flexion of the fetal thighs with excessive pressure the head of the femur against the posterior portion of the rim and capsule. Dupuytren. Hydrops of the joint. Pravaz, Parise, Malgaigne.

Muscle contractures from defects of the nerve-centers. Guerin.

Imperfect development of the bones. Breschet, Gerdy.

Faulty position, adduction, *in utero*. W. Rosen. This writer explains that the male sex escapes dislocation because the testicles become pinched by excessive adduction and this causes a reflex abduction.

Intrauterine trauma. Hippocrates, Cruveillier, Petit, Barth.

Trauma at birth. De Outreport, Broadhurst, Phelps, Adams. On the other hand, Hofmohl and Valetta have attempted to show that the usual traction, etc., during violent births cause fractures and epiphyseal separations, but never dislocations.

Abnormal intrauterine pressure upon a too oblique pelvis. Krukenberg. Paralysis of the hip muscles. Vernuil.

Volkman, Bonvier, and Broca have all shown that luxatio paralytica has nothing at all in common with luxatio congenita.

Disturbances in the growth and development. Too early ossification of the acetabulum. Dollinger.

Abnormal ligamentum Teres. Tillman.

Maldevelopment of the Y-shaped cartilage; degeneration. Grawitz.

Vitium primæ formationis, germ defects. Heusner, Paletta.

Intrauterine pressure (excessive) caused by a lack of liquor amnii and a long-continued extreme flexion of the femur. The difference between the male and female pelvis causes the familiar disproportion between the sexes. The inheritance of this deformity is to be explained by the inheritance of the local intrauterine conditions. Lorenz, Dupuytren, Schanz, Drehman, Codivilla, Bender, Rosen. This theory is similar to that explaining congenital club-foot and flat-foot.

Hirsch claims that the results of the static treatment, the Lorenz operation, conclusively disproves the theory of germ defect.

The male sex make up only 12 per cent of all cases, the female sex 68 per cent.

II. *Pathological Anatomy and Symptomatology.*

There is little difference of opinion as to the main features of these two subjects. According to Lorenz, the acetabulum is rudimentary but is rarely missing and there is always some sort of a rim to it. Its cartilaginous content is increased to such an extent that it would almost seem as though the acetabular cavity was not of normal depth.

The changes in the femur are of greatest importance. The head is atrophic (sometimes, however, relatively enlarged), deformed, mushroomed and flattened in various directions although its cartilaginous cover is usually normal. The neck is almost always shortened, anteverted and distorted.

The ligamentum Teres is normal at birth, but usually becomes atrophied and disappears in about the third year. At times it may become hypertrophied especially when it assists the capsule and muscles in carrying the body-weight. The capsule is stretched into a tube and is later on transformed into tendon-like tissue. The synovia alone is unchanged. The usual dislocation is upward and backward and a new acetabulum is often formed which is, however, fibrous, not bony, and has the thickened capsule as its upper rim. The principal changes in the muscles is a passive shortening. Those muscles which run parallel to the femur are shortened in proportion to the amount of the dislocation. The pelvirochanteric and the pelvi-femoral muscles are lengthened while the pelvicular group are shortened. The latter group, according to Lorenz, are the chief obstacles to successful reduction of the dislocation.

The stereoscopic x-ray has revealed most minutely all various changes in the hard parts.

Symptoms.

The earliest observed symptom was the waddling gait of the bilateral cases. (The objective symptoms of both unilateral and bilateral cases are too familiar to need repetition here. The omission of all reference to the Trendelenburg phenomenon seriously detracts from the value of this chapter. The Trendelenburg symptom is too rarely described, explained and made use of as a diagnostic sign in most of the references upon this subject.)

Treatment and its Results.

1. The mechanical.

2. The bloody.

3. The bloodless.

The first inglorious period dates from 1783, when Paletta first applied a

tight girdle to the pelvis, to the time of Hoffa and is of historical interest only. The best mechanical appliance was devised by Schede who reported several cures.

The era of the bloody operation was ushered in by the total resection of the hip which was soon discarded in favor of the Hoffa operation in 1890. In 1894 Bradford modified Hoffa's operation, as also did Lorenz who conserved the soft parts. In 1895 Hoffa modified his operation so as to make it more in accord with the Lorenz bloody operation, but still he was compelled to report a death rate of 8 1/2 per cent., total ankylosis 11 per cent., and relaxation 10 per cent.; he admits that a full "restitutio ad integrum" is not to be expected.

The bloodless operation was ushered in by the procedures of Paci which consisted of the following procedures:

1. Flexion of the knee and hip to the physiological limit to stretch the joint muscles.
2. Slow abduction of the knee. If the adductors are contracted so that this movement becomes impossible the full method cannot be carried out and the procedures must be terminated.
3. External rotation while increasing the abduction until the leg is in the sagittal plane.
4. Traction is then made upon the leg in this position until all muscles yield and a correction of the deformity attained. Four to ten kilos of extension are applied upon the limb which is fixed in plaster for four weeks, after which the plaster is taken off and the extension continued for twelve weeks longer. The child is then allowed to walk upon crutches with the foot rotated outward. No apparatus or cast is used after the fourth week.

Mikulicz in 1895 does not approve of the bloody operation except in a few chosen cases and uses a bloodless method of his own.

Based upon his experiences with his bloody operation in which he conserved all the muscles, Lorenz gave to the world his bloodless operations which is held to be the first of such methods which really replaced the dislocated hip within the acetabulum. The maneuvers of Paci and Mikulicz only changed a posterior dislocation into a forward one under the anterior superior spine. The details of the Lorenz operation are too familiar to need repetition here even for the purpose of comparing them with Paci's. *To be concluded.*—Walter G. Stern, Cleveland.

The Treatment of Congenital Club-Foot in Earliest Infancy. A Continuation of the Original Controversy Between Lange and Schultze. By Max Herz., *Arch. f. Orthop., Mech. u. Unfallchir.*, Bd. VII, H. 1.

In Herz, Lange (who proposes to do away with the continued fixation of the foot in the overcorrected position by means of plaster casts on account of a rather childish dread of decubitus, etc.) meets with his first opponent who is far enough away (in New Zealand) to call a spade a spade without fear, and this paper ought to be the climax of this long drawn-out dispute.

Herz says that Lorenz had long ago permanently settled the question of the treatment of club-foot in favor of the modeling redressment and that all this dispute can be about is merely the details.

He shows how the success of Lange's treatment really depends upon the faithfulness with which the parents take off his splints and massage and overcorrect the foot and how perfectly they can reapply these splints

after this painful (both to child and parents) process is finished. This treatment lasts until the child is well able to walk, that is till the end of the first year.

This method cannot be compared in rapidity with the twelve short weeks of the orthodox treatment; it makes altogether too great demands upon the endurance and patience of the parents which is in itself extremely detrimental to the success of the undertaking. It is wrong to impose upon ignorant parents a difficult and disagreeable task which should rightfully fall to the lot of the nurse or physician.

There is no more real atrophy from the use of the plaster than from any other method. (This was shown several years ago by Ely, of New York, and it is very evident that Lange, who is in this respect no different from most other contributors to the German orthopedic journals, pays little attention to American medical literature.) Any atrophy that might be present can be overcome by functional use and massage.

Herz excuses Lange's fear of decubitus and eczema from the use of plaster by the thinly veiled sarcasm that it cannot possibly be due to faulty technic but rather from the precept of this earliest medical studies from which he, had never really weaned himself. But no method of fixation other than plaster is able to really hold a corrected club-foot in overcorrection, the statements of Fink, V. Oettingen, and Lange notwithstanding, and it is therefore imperative for everyone who would treat club-foot to master this most difficult art—that of the proper application of a plaster cast. Herz gives an excellent and concise description of this familiar act with a rather far-fetched implication that the above-named writers familiarize themselves with it. He ends his argument with the parting shot that not a single one of Lange's photographs—which are undoubtedly his best—show a *real cure*.—*Walter G. Stern, Cleveland.*

Remarks on the Arthropathies of Acquired Syphilis. By Rupert Waterhouse. *British Med. Jr.*, October 10, 1908.

The object of this paper, in the words of the writer, is in the first place "to draw attention to a cause of joint disease which, though undoubtedly rare, is nevertheless of real medical interest and importance, and in the second place to lend my support, feeble though it be, to a principle emphasized by Dr. Calve, viz., that various clinical forms of arthritis may be induced by the same infection and conversely that identical clinical forms may result from varied infections.

The writer says in the eruptive stage arthritides of various degrees of severity occur. Most common is a subacute synovitis; the knee is the articulation usually implicated. The comparative painlessness, which has been a noticeable feature in many of the recorded cases of syphilitic arthritis, does not always obtain.

In the later stages of syphilis chronic synovitis is met with which is indistinguishable from that produced by many other poisons. Richet has recorded the case of a man, aged thirty-six, who had contracted syphilis fifteen years before, who suffered for two years from attacks of swelling of both knees three or four times a year, each attack lasting three or four weeks. The condition was cured by antisymphilitic treatment; so syphilis may be considered one of the causes of intermittent hydrarthrosis.

Arthritis secondary to gummata in the ends of long bones or in the surrounding soft tissues seldom require to be diagnosed from medical conditions.

In joints which have been the seat of syphilitic disease a condition of osteoarthritis may supervene. In this class of cases much benefit may result from rest, massage, and potassium iodid.

The changes in the joints in Charcot's disease are in no way characteristic of syphilis. Joints are, however, met with in middle-aged men with a history of syphilis long ago in which the magnitude of the swelling and its globular character closely resemble the arthropathy of tabes but which differ therefrom in being painful and rigid.

Little may be said by one reviewing this paper. The statements made are illustrated by case reports, but one cannot help remembering that divers forms of the arthritides may occur in one who has been infected with syphilis and yet be coincident with that disease.—*A. Mackenzie Forbes.*

The Technic of Tarsectomy for Talipes. By Ch. Willems. *Ghent. B. M. J.*, October 3, 1908.

At the 1908 meeting of the British Medical Association the above paper was read and discussed.

The writer subdivided the deformity known as club-foot into three elements any of which may exist alone or any combination of which may exist together. These elements are equinus, inversion of the foot, and adduction of the toes. It is evident that the same treatment is not suitable for these different varieties. For certain cases the treatment is self-evident.

The writer devotes himself to the consideration of the complete equinovarus, saying that he has limited more and more in his practice the use of bloodless methods of correction, even in young children, because the technic of forced bloodless correction is delicate and the consecutive treatment is prolonged. He remarks that whereas the correction of the equinus and the inversion may be easy in nonradical methods, the correction of the adduction of the toes is difficult; that this fact is shown by the awkward gait which is frequently seen after conservative treatment. Of the Phelp's method he says: It does not correct the equinus; it corrects the varus imperfectly; indeed, it only corrects the adduction of the toes. Attention is drawn to an operation called "anatomical" as opposed to "cuneiform" tarsectomy. In this first the astragalus is removed, then the entire width of the anterior portion of the os calcis is resected. This latter resection comprises a sufficient removal of bone to obtain a more or less swinging foot in which the fore part has lost all bony connection with the leg. The foot is then rotated outward to bring the cuboid into apposition with the tibiofibular articulation. This is the distinguishing feature of this operation.

The writer says: "This operation corrects admirably the three elements of the deformity: (1) the equinus by removal of the astragalus; (2) the inversion by the complete raising of the external border, which the movement of rotation accomplishes; (3) especially the adduction of the toes by the great shortening of the external border which is brought about by partial resection of the calcaneum and the displacement backward of the cuboid. A false joint between the cuboid and the tibia is formed which gives to the foot all its suppleness and elasticity whereas, cuneiform tarsectomy leaves the foot much more heavy and rigid."

In studying this description one is impressed with the sacrifice of tissue that is made. It should be, however, of service in some severe deformities. More conservative methods will, however, still be practised in the majority of deformities by those who have had as the writer attests "remarkable success" with it.

Rare Dislocations of the Shoulder, Pelvis, and Hip. By Dr. Linden-stein. From a collection of cases in the City Hospital, Nürnberg.

This article discusses the mechanism, symptoms and treatment of the rarer dislocations of the shoulder, hip and pelvis, emphasizing somewhat the mechanical causes.

I. Retro-glenoid-infraspinatus Luxation of the Humerus.

Patient thrown beneath an automobile. Impact of some portion of machine against scapula while head of humerus was supported on pavement probable cause of dislocation. Usual symptoms present. Reduction moderately difficult by adduction of arm to right angle, extension, outward rotation, and quick adduction with simultaneous pressure on the head of humerus, forward and outward. Three weeks after reduction motion in joint was fairly free, eight weeks after restricted and nine weeks after nearly ankylosed. Subsequently motion was increased and function restored nearly to the normal by mechanical treatment.

This form of luxation is rare. Malgaigne treated but two. Kronlein in a collection of 400 cases of luxation, 206 of which were shoulder, had only one of this type. V. Geyer could collect only thirty cases reported. Rarity explained by anatomical nature of structures around joint.

Associated with the above condition was an iliac luxation of the right hip-joint, probably by indirect force. Extremity in typical position. Reduction by Kocher's method. Fixation in extended position with traction. In nineteen days voluntary motion in all directions and normal function was restored. Also associated with the above conditions was a supraacromial luxation of the left clavicle, fracture of the right eighth rib and many contusions and lacerations. Patient made a good recovery.

II. Luxation of the Right Half of Pelvis.

Except during labor, true luxation of the sacroiliac joint or marked a separation of the symphysis pubis is rare. Luxation of the pelvis, as discussed in this article, does not include simple separation of the symphysis pubis, and involves two synchondroses: the symphysis pubis and the sacroiliac joints. Two forms are observed: 1. Separation of the symphysis pubis and luxation of the sacroiliac joint, and 2. Luxation of the pelvis on the sacrum. Only about fifteen cases of each type have been reported. As a rule, the luxations are associated with injuries of the genitourinary system.

The case under observation had total disability of the leg on affected side, evident separation of the symphysis pubis, pain in the sacral and pubic regions much increased by the least manipulation. Radiogram confirmed diagnosis. Treatment: pelvis fixed, traction to extremity in extreme abduction continued for three weeks, then fixed in crossed position for one week. Patient walked normally after four weeks.

III. Perineal Luxation of the Hip-joint.

Caused by the combination of direct and indirect force. Thigh sharply flexed, sharply abducted and outwardly rotated, gluteal musculature flattened, and head of femur felt in perineum behind scrotum. Reduction by flexion of knee, traction in same position, then adduction and inward rotation followed by extension and fixation. In fourteen days function was fairly good; in three weeks normal.

This article at least adds to the literature more of the rarer forms of joint luxations.—*Dr. W. J. Merrill, Philadelphia.*

A Case of Congenital Coxa Vara. By Dr. O. v. Frisch, assistant in von Eiselsberg's clinic, Vienna. in the *Wiener klin. Wochenschrift*.

Three groups of coxa vara in childhood are recognized: 1. The rachitic, due more to a bending of the upper end of the femur than to a change of the normal angle of the head; 2. the form which develops as a result of epiphyseal separation or fracture of the neck, and 3. congenital coxa vara.

Case under Discussion.—Patient walked at one year with characteristic waddling gait. Deformity resembled double congenital dislocation. Pelvis inclined sharply forward. Great trochanters in iliac fossæ, 4 1/2 cm. above Nelaton's line. Trendelenburg's sign present. Abduction and outward rotation of femur limited. Parallel position of the feet in walking. A radiogram showed angle of neck, left 62°, right 68°. Heads removed somewhat from acetabulum. Upper contour of femur at Y cartilage. Right epiphyseal line irregular, broad, nearly vertical, so near shaft of femur as to nearly obliterate the neck and split into parallel parts including an asymmetrical piece of bone, the left similar to the right forked at the middle including a triangular piece of bone. Trochanters and their epiphyses normal.

Hubling believes that the lateral zone of the epiphyseal line has a special significance and describes the condition under "Congenital Fissure of the Neck of the Femur" stating that the fissures are always placed vertically to the femur neck, are unequal, open below, are always lateral to the epiphysis of the head and appear in a bilateral symmetrical arrangement. In the region of the fissure the epiphysis may be wanting or faintly indicated.

Hoffa described congenital coxa vara as a typical affection and gave as pathognomonic signs short neck of femur, its axis placed at a right or acute angle to that of the femur, no bowing of femur, epiphyseal lines irregular vertical frequently forked at the middle inclosing an asymmetrical piece of bone, not associated with rickets or trauma.

The congenital nature of the deformity is suggested by the typical waddling gait at first attempts to walk, absence of rachitic symptoms, lack of trauma, bilateral condition and the tendency to the deformity in other members of the family.

Hoffa found in microscopic sections of the epiphyseal area, prepared from a typical case, absence of proliferation, deposition of fibrous connective tissue poor in cells, and concluded that "bioplastic energy" was absent as a result of uterine disease which destroyed the process of development. It is improbable that bone disease, established and existing *in utero*, as a rule bilateral and by predilection localized in the epiphysis, should explain the condition, especially as the trochanters are always normal. Undoubtedly such a disturbance would retard the development of the head and result in an hypoplasia, but as a rule the head is of normal size.

Congenital coxa vara often precedes other malformations, and frequently appears in different members of the same family. It is not treated in this article as a profound disease disturbance of normal development, but as a true malformation—a defect in the primordial cells. It is difficult to explain whether the preformed cartilage head is in varus position or that the deformity is developed at the beginning of the ossification period.

The vertical, irregular epiphyseal line influences fissure formation, is above the head and the proximal end runs into the joint cartilage. The typical characteristics of the epiphyseal line bears evidence of a vitium primæ formationis.

The neck begins to ossify at birth; at 18 months the ossification area has approached the head and the epiphyseal line of the latter is formed; at three to four years the head is ossified, the epiphyseal line of the neck holds its original position.

The remarkable deformity as well as the position of the epiphyseal line cannot be explained by disease during the developmental period, it is also unlikely that a disturbance of ossification before the period of weight-bearing should develop coxa vara. If the preformed cartilage neck be in varus position the ossification zone taking an abnormal direction would influence the inclination of the abnormal epiphyseal line. It is probable that the direction of the normal epiphyseal line is a result of the normal progress of the ossification zone of the shaft of the femur. If the preformed cartilage neck be in normal position and disease *in utero* be excluded, then the deformity must be explained by a disturbance in the process of ossification, in which there is an unequal activity of ossification in the upper and lower portions of the diaphyseal area, more rapid in the upper portion or the presence of a supernumerary ossification zone.—*W. J. Merrill, Philadelphia.*

Further Pathologic Anatomical Investigations with Regard to Congenital Dislocation of the Hip. By Gocht. *Zeit für orth. Chir.*, XXII Band, 1-3 Heft, 1908.

Gocht concludes as follows:

1. The usual position of the fetus in the uterus is characterized by flexion, external rotation, and slight adduction of the hips.
2. Every violent forcing of this normal position must lead to a retroversion of the upper end of the femur.
3. By insufficient inward rotation of the hip-joint there results an anteversion of the upper end of the femur.
4. An eversion depending on the turning of the shaft of the bone must be regarded as intrauterine and primary as opposed to secondary turning which takes place during life in the region of the neck and head of the bone.
5. Marked anteversion of the upper end of the femur must under certain conditions lead to retroversion of the neck and head.
6. Luxation taking place early, say in the third or fourth month, tends chiefly to nearthrosis formation; the later luxation takes place, the more the nearthrosis formation is frustrated.

Corresponding with earlier findings, his preparations show 7. that the lig. ileofemor. sup. is markedly shortened and very strong.

8. The same ligament becomes very tense in energetic motions of the hip.
9. The same band serves in ultraphysiological movements of the head of the bone as an anchored band, governing motion.

10. The right angle flexed position of the hip-joint leads to tension of the whole hip-joint, especially of the anterior parts. In this position the inner capsule and the anterior lower acetabular pocket are best adapted to take up the head again and to let it re-enter into its own primary socket.

11. The position of external rotation with marked abduction offers, even in these pure capsular preparations, the most natural advantages for the retention of a reduced head. Every inward rotation causes leverage and shoves the head from the acetabulum.

This paper is of considerable interest, but the findings are not different from those of other men who have followed up this subject.—*Henry O. Feiss, Cleveland, O.*

The Results of Cured Congenital Dislocation of the Hip. By Froelich.
Zeit. für Orth. Chir., XXII Band, 1-3 Heft, 1908.

After a cure of hip dislocation has been achieved and the patient has been normal for years afterward, one might believe that he has disposed of the case, and that there were no more evil effects to fear. This is, however, not entirely correct. A few of the healed cases return again on account of pain developing in the hip-joint or because a limp begins again. In his statistics he deals with 230 cases—30 per cent. completely cured, 50 per cent. almost completely cured, and 20 per cent in which the limp persisted. Strange as it may seem, it was from that group of cases which were completely cured that some patients returned on account of unpleasant developments. There were ten such cases as follows:

- Four cases of coxa vara.
- Two cases of total disappearance of the neck.
- Two cases of tuberculosis of the hip.
- One case with traumatic luxation of the hip.
- One case with infantile paralysis.

Description given of these cases.

This paper is interesting as governing our views on prognosis after reduction.—*Henry O. Feiss, Cleveland, O.*

The Open Reduction of Congenital Dislocation of the Hip. By Ludloff. *Zeit. für orth. Chir.*, XXII Band, 1-3 Heft, 1908.

A brief report describing the author's method of reduction. After the bloodless method has been tried and proved unsuccessful, he puts the hip in plaster in a position of right-angle abduction for three or four weeks and then makes an incision along the inner edge of the adductor magnus. The capsule is opened and the acetabulum exposed. Then the Lorenz maneuver is made showing where the head is behind the acetabulum. With a bone-hook the head is drawn into the socket after the interposing factors are incised. The capsule is not interfered with any more than is necessary and the cartilage is left intact. Then the lower capsule wall and the skin wall are closed and the leg put up in plaster as usual. Certainly this operation seems to be the cleverest so far devised for open reduction and Ludloff's great experience in treating the deformity by the bloodless method ought to be a special recommendation.—*Henry O. Feiss, Cleveland, O.*

IX. TRAUMATIC LESIONS; FRACTURES AND DISLOCATIONS; SPRAINS.

Three Cases of Fracture of the Femoral Shaft Treated by the Open Method. T. W. Huntington. Abstracted in *Journal A. M. A.*, Dec. 5, 1908, p. 2003.

Ueber einen Bruch des Gelenkfortsatzes des fünften Lendenwirbels. Burk. Abstracted in *Zentralbl. f. chir. u. mech. Orth.*, October, 1908, p. 452.

Le fratture della gamba. Bergolli. Abstracted in *Zentralbl. f. chir. u. mech. Orth.*, Sept., 1908, p. 426.

Behandlung und Mortalität bei Schenkelhalsfrakturen. Pajerno. Abstracted in *Zentralbl. f. chir. u. mech. Orth.*, Sept., 1908, p. 422.

Beitrag zur Kasuistik seltener Frakturen im Ellenbogengelenk. Fette. Abstracted in *Zentralbl. f. chir. u. mech. Orth.*, Sept., 1908, p. 417.

Sulle fratture indirette dell'estremo superiore della tibia. G. Moro. Abstracted in *Zentralbl. f. chir. u. mech. Orth.*, October, 1908, p. 465.

Ueber einen Bruch des Gelenkfortsatzes des fünften Lendenwirbels. Burk. Abstracted in *Zentralbl. f. chir. u. mech. Orth.*, October, 1908, p. 452.

Morte subite chez une malade atteinte de fracture de jambe. Berger. Abstracted in Zentralbl. f. chir. u. mech. Orth., October, 1908, p. 468.

Ein Fall von isolierter Fraktur des Trochanter major beim Erwachsenen. Leede. Abstracted in Zentralbl. f. chir. u. mech. Orth., October, 1908, p. 463.

Sulle fratture indirette dell' estremo superiore della tibia. G. Moro. Abstracted in Zentralbl. f. chir. u. mech. Orth., October, 1908, p. 465.

Three Cases of Fracture of the Femoral Shaft Treated by the Open Method. T. W. Huntington. Abstracted in Journal A. M. A., Dec. 5, 1908, p. 2003.

Morte subite chez une malade atteinte de fracture de jambe. Berger. Abstracted in Zentralbl. f. chir. u. mech. Orth., October, 1908, p. 468.

Ein Fall von isolierter Fraktur des Trochanter major beim Erwachsenen. Leede. Abstracted in Zentralbl. f. chir. u. mech. Orth., October, 1908, p. 463.

Resecction total de la rodilla. Tratamiento postoperatorio. Soler. Abstracted in Zentralbl. f. chir. u. mech. Orth., Sept., 1908, p. 425.

Myositis ossificans traumatica im M. subclavius nach Luxatio clavic, supra-acromialis. M. Strauss. Abstracted in Zentralbl. f. chir. u. mech. Orth., Sept., 1908, p. 415.

X-Ray Plates of Fractures. Channing C. Simmons. Medical Communications of the Massachusetts Med. Society, Vol. XXI, No. 1, 1908, p. 361.

Fracture of Patella; Radiographic Illustrations of Results of Treatment by Suture. J. M. Batchelor. Abstracted in Journal A. M. A., Jan. 9, 1909, p. 169.

Un caso di spondilolistesi. Codivilla. Reported in Zentralbl. f. chir. u. mech. Orth., November, 1908, p. 528.

Fractures of the Hip. Walter L. Hunt. Trans. of the Maine Med. Association, p. 255, Vol. XVI, Part II, 1908.

Fracture of the Astragalus with Dislocation of the Fragments. J. H. Stealy. Reported in Boston Med. and Surg. Jour., Dec. 10, 1908, p. 799.

Dislocation of the Os Calcis or Subcalcanean Dislocation of the Foot? A. Kirchner. Deutsche Ztschr. f. Chir., Bd. 93, H. 1-6, April-July, 1908.

A New Apparatus for the Treatment of Fractures of the Arm. E. Martini. Deutsche Ztschr. f. Chir., Bd. 93, H. 1-6, April-July, 1908.

Fracture of the Os Magnum. Anthony Hart Harrigan. Annals of Surgery, December, 1908, p. 917.

Doppelseitige habituelle Schulterluxation. Openshaw. Abstracted in Zentralbl. f. chir. u. mech. Orth., Dec., 1908, p. 556.

Case of Fracture and Dislocation of the Second Cervical Vertebra. C. D. Fox. New York Med. Jour., Dec. 5, 1908.

Zur Prognose der traumatischen, unkomplizierten Schulterluxation. Schulz. Beiträge zur klin. Chir., October, 1908, LX, Nos. 1-2.

Typical Fracture of Epicondyle of the Femur. K. Vogel. Archiv f. klin. Chir., XXXVII, No. 4, 1908.

A Note on Operation for Discoloration of the Shoulder and of the Hip. Gilbert Barling. Surgery, Gynecology, and Obstetrics Nov., 1908, p. 566.

Fracture of Patella, with Skiagrams of Results of Treatment by Suture. J. M. Batchelor. Journal A. M. A., Dec. 5, 1908, p. 1944.

Ostitis gummosa mit Spontanfraktur. Paul Frangenheim. Abstracted in Ztschr. f. orth. Chir., 1908, XXI Bd., 4 H., p. 611.

Luxation traumatique de l'épaule en haut. Tavernier and Chalier. Revue d'Orthopédie, 1908, No. 4.

Two Cases of Dislocation of the Pelvis. Grimbach. Abstracted in Boston Med. and Surg. Jour., Jan. 28, 1909, p. 121.

Three Cases of Fracture of the Lower End of the Humerus. F. C. Wallis. Lancet, No. 9, 1908.

Die Fraktur des Collum radii. H. Flörcken. Abstracted in Ztschr. f. orth. Chir., 1908, XXI Bd., 4, p. 647.

Ueber den classischen Radiusbruch. Lilienfeld. Abstracted in Ztschr. f. orth. Chir., 1908, XXI Bd., 4 H., p. 648.

Radiusfrakturen mit volarer Verschiebung des peripheren Fragmentes Smith-Linhartscher Typus). Jacobsthal. Abstracted in Ztschr. f. orth. Chir., 1908, XXI Bd., 4 H., p. 648.

Luxation des Os lunatum. Pathologische Anatomie und blutige Reposition desselben. Adolf Ohly. Abstracted in *Ztschr. f. orth. Chir.*, 1908, XXI Bd., 4 H., p. 649.

Luxation du semi-lunaire en avant. Tricot. Abstracted in *Ztschr. f. orth. Chir.*, 1908, XXI Bd., 4 H., p. 649.

Dislocation du carpe. Destot. Abstracted in *Ztschr. f. orth. Chir.*, 1908, XXI Bd., 4 H., p. 651.

Behandlung des supracondylären Oberarmbruches. H. Coenen. Abstracted in *Ztschr. f. orth. Chir.*, 1908, XXII Bd., 4 H., p. 684.

Fracture intracapsulaire du col du fémur gauche. Tixier. Abstracted in *Ztschr. f. orth. Chir.*, 1908, XXI Bd., 4 H., p. 654.

Ein Beitrag zur Behandlung veralteter Patellarfrakturen. Oskar Harasiewicz. Abstracted in *Ztschr. f. orth. Chir.*, 1908, XXI Bd., 4 H., p. 668.

Punch Fractures. By Harold Burrows. *British Medical Journal*, March 28, 1908.

This is an article on the subject of fractures of the metacarpal bones due to a resisting object being struck with the closed fist. The varieties mentioned are: 1. Fracture of the first metacarpal bone, not involving the articular surface. 2. Bennett's fracture. 3. Fracture of the head or shaft of one or more of the metacarpal bones of the fingers. 4. Fracture of the base of the fifth metacarpal bone resembling Bennett's fracture of the thumb. Mr. Burrows cites case reports and gives skiagraphs of each variety. He says, "although as a rule these 'punch' fractures cause little inconvenience of either an immediate or remote nature to the recipient, yet it is of some importance to recognize them." The immediate deformity resulting from a Bennett's fracture may not be plainly demonstrable, but in fracture of a metacarpal bone of one of the fingers there is commonly an angular projection on the dorsum of the hand.—*A. Mackenzie Forbes.*

The Theory of the Different Mechanism of the Dislocation of the Lunar Bone. By G. Montandon, Zuerich. *Beiträge für klinische Chirurgie*, 1908, Vol. 57, p. 9.

Among 513 lesions of the wrist in the surgical clinic in Zuerich, Montandon found nine cases of dislocation of the lunar bone. Three on the right and six on the left hand; all in males. One was a dorsal dislocation, the second case published in the literature. (The first is published by Erichson in *Science and Art of Surgery*, I, p. 665.). From the histories reported it may be seen that the volar dislocations are usually caused by a fall or blow on the palm of the hand while in dorsal flexion or by a blow on the elbow while kept in right-angle position or on the dorsum of the hand fixed in dorsal flexion.

After a discussion of the different theories about the mechanism of the dislocation, Montandon describes thoroughly the mechanism of the wrist joint. The wrist is a composed or a so-called Cardan joint. The chief components are the radius, lunar and capitatum, which allow motions in two planes. The theory of a globe joint is not right, because such a joint allows movements in all three planes, but in the wrist rotation is not possible. To explain the mechanism of the dislocation the different forces are analyzed. In dorsal flexion there is a rotating and a pushing force. Both act on the os capitatum and their common power is the greater the more closely they act. It is a simultaneous displacement. The ligamentum radio carpeum volare is the most powerful ligament attached to the lunar which is usually not torn off while the other ligaments will be torn. Besides these forces the

lateral pressure of the scaphoid and trapezium are acting (cherry-stone theory). Simple schematic pictures explain very clearly the mechanism.—*H. Bucholz, Boston.*

Blood Examinations in Fractures. By Bernhardt, Pisa. Abstract in *Centr. für chir. und mech. Orthop.*, 1908, p. 535.

Report about more than one thousand blood examinations of normal individuals and those who have sustained fractures. In all fractures the circulating leukocytes are increased in number. Conclusions from his tables:

1. When a fracture has occurred the absolute number of the leukocytes is increased in relation to age, importance of the injured bone, and seriousness of the fracture.

2. This increase reaches its culmination on the tenth to fifteenth day and decreases with the progress of the cure.

3. In the blood of all people with fractures there is a distinct number of myelocytes, which is without any relation to age, bone involved, or injury.

4. The multinuclear neutrophile cells, the large mononuclears and the transitory forms are always (except in very aged patients) remarkably increased, in contrast to the lymphocytes.

5. The eosinophile cells decrease in the first days after the injury, while they exceedingly increase afterward, if no complications arise.

6. The lack of or a very small number of or the gradual vanishing of circulating eosinophile cells in fracture patients is a sign of more or less grave complications in the course of the injury.—*H. Bucholz, Boston.*

Case of Dislocation of the Hip with Fracture of the Acetabulum. By C. H. Bucholz. *Boston Med. and Surg. Jour.*, December 3, 1908.

Young man had his right leg caught in large wheel of an engine. He was turned about once or twice and thrown to the ground. Thigh was fixed in flexion, adduction and inward rotation. Diagnosis, dislocation. Attempts at reduction failed. Fifty pounds traction applied for some days, but reduction again impossible. Open operation showed a triangular fragment of bone, size of a child's hand, jammed between head of femur and acetabulum. It was the upper and posterior rim of the acetabulum. After its removal, the dislocation was reduced, and an extension bandage and plaster spica applied. Result good.—*E. W. Ryerson, Chicago.*

A Modification of the Bradford Frame for the Treatment by Suspension of Fracture of the Femur in Young Children. By David Silver, M. D., Pittsburg, Pa. *Annals of Surgery*, January, 1909.

The frame is made in the customary way, but with a T connection opposite the hip-joint of the fractured leg. "Into the T is screwed an upright piece of pipe long enough to reach about 4 inches above the suspended foot. An L. connection and a short (2 or 3 inch) transverse pipe, ending in a cap, completes the attachment." The child is fixed to the frame and the foot suspended from the transverse bar.—*R. R. Fitch, Rochester, N. Y.*

Portable Traction Apparatus for Treating Fractures of the Femur and for Various Orthopedic Operations. Chester M. Echols, M. D., Millwaukee, Wis. *Annals of Surgery*, January, 1909.

A detailed description of an apparatus for holding the body and producing traction on the legs during the application of the plaster-of-Paris spica.—*R. R. Fitch, Rochester, N. Y.*

Fracture of the Os Magnum. By Anthony Hart Harrigan, M. D., New York. *Annals of Surgery*, December, 1908.

Report of such a case and a review of the five cases in literature. The writer considers the subject in detail, and reaches the following conclusions. 1. Fracture of the neck of the os magnum may be caused by direct or indirect violence. 2. The most characteristic symptom is a point of exquisite tenderness over the neck of the bone. 3. All severe sprains of the wrist-joint should be subjected to x-ray examination. An x-ray print accompanies the report of the case, but it is not clear.—*R. R. Fitch, Rochester, N. Y.*

Delayed Union in Fractures. By C. Staltz. *Lancet-Clinic*, Cincinnati. September 5, 1908, Vol. C., No. 10, p. 273.

Author thinks the greatest cause an intrinsic difference in osseous make-up of individuals. Cites several cases to illustrate the variations in time before union of corresponding bones in different patients. Next important causes are inadequate adjustment and inadequate immobilization. Treatment, patience and prolonged fixation. If operation has not been adopted at first, he does not advise it until several months have shown the inutility of prolonged fixation.—*G. G. Turner.*

Fracture of the Radius in Children. By Johan Nicolaysen. *Norsk Magazin for Laegevidenskaben*, 1908, Vol. LXIX, No. 8, p. 793.

The author points out that the characteristic deformity following Colle's fracture in adults is seldom or never present in children, where the conditions following a fall upon the hand in dorsal flexion is of one of two types.

In the first of these where there is swelling over the lower end of the radius and an approach to the silver-fork deformity, x-ray examination in the lateral plane shows a green-stick fracture without displacement of the fragments, a condition which offers a much more favorable prognosis.

In the second type there is a complete separation of the epiphysis with backward displacement. This is considered a most serious condition with a doubtful prognosis as to perfect result, but in children it has frequently been shown that even if a serious fracture is inadequately handled, nature straightens out distortions in a wonderful manner. The author cites a case of radial fracture which he was unable to fully reduce, and which six months later showed a perfect result.

He concludes that the prognosis of fracture in children is much more favorable than in adults.—*Emma Lootz Erving, Washington.*

Traumatic Inflammation of the Joints and Compensation for Industrial Accidents. By Koenig, *Berliner klin. Wochenschrift*, 1908, Vol. XLV, No. 37, p. 1669.

The author in this article defines as precisely as possible the relation between inflammation of the joints and the injuries to which such conditions may be ascribed in industrial accidents. Comparatively few cases arrive solely from external injury. There is usually some internal condition, combining with the injury to produce the lesion. In 100 cases of inflammation of the hip, twelve cases were due to injury, and in twenty-eight cases of gonorrheal disease five were of traumatic origin. In 566 cases of tuberculosis of the hip, eighty-six were traumatic. In acute inflammations he distinguishes (a) aseptic traumatic joint effusions, as hemarthrosis and traumatic hydrops, and (b) septic traumatic conditions, in which an organism as gonococcus or staphylococcus or even pneumococcus or the typhoid bacillus circulating in the blood, finds a lodging in the joint tissues, which have been weakened

and hurt by violence. A joint inflammation can almost certainly be considered of traumatic origin when it arises directly after some injury to the joint, and a focus of suppuration in some part of the body is a further indication of a septic traumatic process. If in the course of a few weeks after an injury inflammation arises in the injured joint, it can almost certainly be referred to the violence sustained.

It may be taken as a fact that swelling and abscess may occur a long period after an injury to a bone, for an infected portion of the bone may not sequestrate for a varying length of time after violence has been sustained and then it may find its way into a joint and cause inflammation.

But in the interval between the injury and the appearance of the joint lesion there must be symptoms as swelling, pain, fever, or limitation of function. In the absence of any such symptoms, connection between injury and lesion may be denied.

Tuberculosis of a joint is always a metastatic condition, conveyed by the arterial blood, and it is often difficult to determine whether or not such a condition is due to trauma. A careful history of the case is important. If an injury has occurred within two weeks the connection may be considered clear, and the time may be extended to three months. In longer periods than this to demonstrate cause and effect symptoms of injury must have been present continuously.—*Emma Looz Erving, Washington.*

Origin and Treatment of Injuries of Semilunar Cartilages of Knee-joint. By M. Katzenstein. *Berl. klin. Wochenschrift*, 1908, Vol. XLV, No. 5, p. 228.

The author describes briefly seven cases of injury to the semilunar cartilages, and after discussing the condition somewhat fully, summarizes as follows:

1. Injury to the semilunar cartilages results from an action of a force exerted perpendicularly or horizontally to the cartilage when it is fixed, by direct pressure of the articular surface of the femur, or by tightening of the joint capsule, due to the contraction of the quadriceps muscle.

2. On account of the less firm connection of the median cartilage to the tibia, and its close association to the joint capsule, this cartilage is more often injured than the lateral.

3. The injury affects either the connecting fibers of the under surface or else the substance of the cartilage itself.

4. The diagnosis is established by a combination of characteristic symptoms tenderness on the inner aspect of the joint, occasional swelling, acute pain caused by pinching the loosened cartilage between the opposing joint surfaces, and in some cases the dislocated cartilage can be felt.

This condition can with difficulty be distinguished from rupture of the capsule, if a portion of the capsule become pinched in the joint.

5. Conservative treatment is often desirable in cases of recent injury, but in cases of long standing, operation only is sufficient. The author recommends in every case where it is possible, fixation of the semilunar cartilage to the tibia, as resection of the cartilage seldom gives a permanently good result.—*Emma Looz Erving, Washington.*

New Method of Treatment of Fracture of the Patella. By Sacchi, *Archivio di Ortopedia*, 1907, Vol. XXIV, No. 1.

The writer advocates in operative treatment of acute fracture of the patella a modification of the method of Volkmann in 1868.

With the idea of avoiding an open incision into the cavity of the knee-joint,

and over the patella with added danger of subsequent adhesions, etc., he makes a short longitudinal incision over the quadriceps tendon, and a similar one over the patella tendon. Through the former a strong silk suture is carried on a needle which is then passed beneath the fragments of the patella, emerging through the patella tendon, and returning to the original point, subcutaneously over the patella. The other end of the suture is passed in the opposite direction subcutaneously, then through the patella tendon, back under the patella and out through the quadriceps tendon. The fragments are then closely approximated, and the two ends of the suture drawn tight and tied, with a resulting strong double loop, encircling the patella, longitudinally.

The patient begins to walk with support to the knee and crutches in ten days and freely in three weeks. He has had rapid convalescence and never any signs of irritation from the suture, and the short incisions are so located that they can give no trouble.—*William G. Erving, Washington.*

Treatment of Traumatic Effusion in the Knee. By Hartleib. *Münch. med. Woch.*, October 22, 1908, LV, No. 43.

Author relates his personal experience with a hydrops genu traumatica. Ice-bag failed to be of any benefit. Treatment by fixation and compression for five days followed by hot air and massage reduced pain and swelling so that on the tenth day he attempted to use it. This was followed by recurrence which was relieved by hot air, sponge compression, massage, and moist dressing. After eight days on a second attempt at use there was a second recurrence which under the same treatment, continued somewhat longer, was permanently relieved. Author naturally concludes that treatment for this affection should be prolonged more than is usual and if after above-outlined treatment relief is not obtained joint should be flushed with 3 per cent. carbolic followed by normal salt solution and fixation. Patient should not walk until several days after all effusion has disappeared and should wear flannel bandage for several weeks.

Report on Intrauterine Fractures and Bone Deformities. By Chrysospathes. *Zeit für orth. Chir.*, XXII Band, 1-3 Heft, 1908.

This is a case report of a girl fifteen days old. The essential findings are those shown in the Röntgen pictures on which are to be determined bends in the long bones, sometimes very pronounced, and other evidences of bone fractures. In attempting to classify this condition, one is confronted by the extreme confusion of the nomenclature. The literature is investigated with some detail. The interesting point about his case is the advanced stage of ossification which the bones manifest, but with no signs of callus formation as found in the usual fractures. If we regard these fractures as taking place at an early period of life, then it is probable that the cause is a disturbance in the organism which interferes with bone development.—*Henry O. Feiss, Cleveland, O.*

The Principles of Treatment in Old Traumatic Dislocations of the Hip. By Lorenz. *Zeit für orth. Chir.*, XXII Band, 1-3 Heft, 1908.

The chief points which Lorenz makes are as follows: Although he has done many, and in part very difficult, open repositions of congenital luxations in children with fortune and success, he maintains that he has never decided under any circumstances to carry out an open reposition in the old traumatic luxations in adults, because, according to his feeling, the danger to life of the

patient is of relatively greater weight than the possible gain. According to his notion, the indications for open treatment of old traumatic luxations are not to be regarded as justifiable. The first principle must always be to bring the patient to the greatest usefulness with the least danger of life. This is only to be achieved by the closed method, but if it is not achieved we attempt a pseudoreposition or the transposition of the head into a sub-spinal place or a lateral apposition. The author describes a case. This paper is consistent with Lorenz's previously expressed conservative ideas.—*Henry O. Feiss, Cleveland, O.*

X. APPARATUS AND X-RAY.

Le corset en celluloid. Laurent et Brex. Abstracted in *Zentralbl. f. chir. u. mech. Orth.*, Sept., 1908, p. 409.

Ein Waschtisch für orthopädische Operationszimmer. Schanz. Abstracted in *Zentralbl. f. chir. u. mech. Orth.*, Sept., 1908, p. 409.

Einfachste Extensionsapparate. Kuhn. Reported in *Zentralbl. f. chir. u. mech. Orth.*, Dec., 1908, p. 545.

The Most Ancient Splints. By G. Elliot Smith. *British Medical Journal*, March 28, 1908.

This is a very interesting article which describes carefully the splints found on fractured limbs of mummies which had been applied to living patients about five thousand years ago.

The description of the splints and their relationship to the fractured bones gives us a clear idea of the methods of those who treated fractures in ancient Egypt. The fixation of the nearest joint and the protection of the injured part from without seem to have been the main objects of treatment.

Unlike the modern European surgeons, the old Egyptian employed more than two splints in the treatment of fractures of both the arm and the leg.

It is a common custom in the Egypt of to-day to employ splints of much the same character as those described in this article.—*A Mackenzie Forbes.*

Remarks on Mechanotherapy in Joint Diseases. By Laqueur, Berlin. *Zeitschrift für physikalische und diätetische Therapie*, XII. Abstract in *Centr. fuer chir. und mech. Orthopaedie*, 1908, p. 448.

In acute articular rheumatism relief may be obtained by slight frictions of the centrally situated muscle groups, also very slight active motions in the hot bath may be done if they do not cause pain. In the conditions following articular rheumatism pain must be primarily relieved by warm-water baths, electric-light baths, steam douche, local water baths, Bier's congestion, and afterward mechanotherapy may be applied.

In chronic articular rheumatism all exacerbations and recurrences contraindicate mechanical treatment. Those must be removed by hydro- and balneotherapeutic methods, while pain may be relieved by application of warmth. Bier-Klapp's suction apparatus may be used to mobilize the joints.

In arthritis deformans, after relief from pain, mechanotherapy may be used to advantage, although several months often will be needed. The same methods are valuable in gonorrheic arthritis. For persistent pain in the heel high-frequency currents are often effectual. In tubercular joints, if there is any indication for mechanical treatment, only manual manipulations with the greatest care may be applied, while in cases of old syphilis without acute inflammations the usual mechanotherapy is valuable.—*H. Buchholz, Boston.*

Bandages, Apparatus and Braces. By Wm. Becker. (An Abstract of the Literature of 1907.) *Arch. f. Orthop., Mech. u. Unfallchir.*, Bd. VII, H. 1.

To keep gauze from adhering to wounds, Meyer dusts them with sterilized sugar containing 2 per cent. of salicylic acid, this keeps wounds dry, but is contraindicated in hemorrhage and suppuration.

Various new bandages are recommended for different fractures and dislocations, the most important of which are Finck's two-part cast for fracture of the femur, Riedl's modification of the Sayre bandage for fracture of the clavicle and Karewski's extension apparatus of adhesive plasters for treatment of rupture of the quadriceps extensor muscle.

Evlér recommends the use of chrome leather for all kinds of braces on account of its extraordinary strength, plasticity, and softness.

(This abstract, like all of Becker's, should have been labeled an abstract of "German" literature as all other countries outside of Germany are persistently and deliberately ignored).—*W. G. Stern.*

Massage and Mechanical Therapeutics. By Wm. Becker. An abstract of the Literature of 1907. *Arch. f. Orthop., Mech. u. Unfallchir.*, Bd. VII, H. 1, p. 73.

Massage.

In the so-called cases of relaxed joints, there is as much relaxation of the muscles as of the joint capsule and they must therefore be treated as well.

Klapp uses an interrupted current of compressed air for painless vibratory massage.

Lininger rightfully warns against the use of massage and passive motion in acute inflammatory or tubercular conditions and declares that excessive force should never be used.

On the other hand, a French writer, Kouindjy, advises that all cases of "dry congestive arthritis" whether tubercular or not should be vigorously massaged.

Berne cautions against the use of massage in phlebitis until at least one month after all acute symptoms have subsided. Other authors would wait even longer.

Gymnastics.

On the one hand Deutschlander advises early massage and gymnastics with or without splints to hasten union, etc., in fractures, while Slowman advocates the same measures after mobilizing operations and resections.

Klapp has made additions to the technic of his "crawling" treatment of scoliosis, the value of which is now being seriously questioned by many authors.

Chlumsky cites several cases of scoliosis occurring among "human serpents."

Lange's monograph on the treatment of scoliosis by means of gymnastics and simple forms of apparatus is a valuable contribution.—*Walter G. Stern, Cleveland.*

Physical Therapeutics.—By R. Tait McKenzie, M. D. *Am. J. Med. Sc.*, Oct, 1908.

Dr. McKenzie makes the following division of exercises:

Active.

- a. Effort—violent muscular contraction, weight lifting, jumping, etc.
- b. Endurance. Easy movements repeated until the onset of fatigue.

Walking is the best example. Many exercises combine both effort and endurance, as boat racing, running, etc.

c. Duplicate movements. In these the direction of the motion is controlled and the amount of resistance is estimated and prescribed.

Passive.

In these the will-power is not exerted. Massage, vibration, etc.

Dr. McKenzie then goes on to explain how these various exercises are employed therapeutically. Patients with faulty posture must be reeducated to stand and sit properly. Heart cases are much benefited by exercises of endurance, graduated according to the patient's power. Obesity can often be controlled by exercise alone. The exercise should begin with modern trunk flexions, extensions, and adductions followed later as the muscle tone improves with walking and hill climbing. This combined with a regulated diet is often very beneficial. Constipation, hernia, and a number of diseases of the nervous system are much helped by exercise in proper doses.

He says that exercise in its application to pathological conditions of posture, of nutrition, of circulation, and of the nervous system must depend for its success upon careful selection and accuracy of the kind of dose employed and on persistence in following out a course of treatment.—J. W. Sever, Boston.

Orthopedic Apparatus for Amputation of the Leg. By Delore. *Revue de Chirurgie*, 1903, Vol. XXXVII, No. 3, p. 394. (Report from the Société de Chirurgie de Lyon, Meeting of Jan. 23, 1908.)

Patient, a young man, had had amputation seven years previously. Walked almost normally with new apparatus. Counterpressure not against ischium but against the epiphysis of the tibia. The stump gave command of flexion and extension, and the apparatus afforded some movement at the ankle. It cannot be applied to a stump less than 18 cm. long.

The scant description does not mark it as in any way superior to similar apparatus made in this country.—W. G. Turner.

Technic of Ambulatory Plasters. By Frankel. *Münch. med. Woch.*, Aug. 18, 1908. LV, No. 33.

This is a description of plaster and apparatus to be used in disabilities or injuries of the ankle and foot, where it is desirable to have the patient walk. It consists of a U piece, the uprights of which are incorporated into the plaster with the cross-piece at the bottom coming some inches below the heel. The plaster itself is molded to the calf and tibia so that the support comes on the head of the tibia. Instead of plaster a leather stocking can be used permanently. A high shoe is applied to the other foot.

Certainly this apparatus is simple and must be practical. The construction reminds one of the Bügel-eisen seen in Lorenz's clinic as used by him for acute hip disease. Nevertheless, the present application seems to be original.—Henry O. Feiss, Cleveland, O.

The Evil Influence of Swedish Gymnastics and Similar Exercises showing increased Laxity. By Chlumsky. *Zeit für orth. Chir.*, XXII Band, 1-3 Heft, 1908.

As indicated in the title this author believes that many exercises are harmful and he cites cases in which after long periods of exercises, relaxation has taken place and the cases really get worse after treatment than they were before. It is to be admitted that the author is correct that in spite of exercises some patients do get worse, but this does not mean that the exercises were the cause. Nevertheless, the suggestion is of importance and a few of us

are beginning to feel that a simple and light brace, the aim of which is to hold the patient while he grows up, is safer than any exercises at all.—*Henry O. Feiss, Cleveland, O.*

XI. MISCELLANEOUS DISEASES. GENERAL ORTHOPEDIC ARTICLES. PHYSICAL THERAPY, ETC.

A Case of Erythromelalgia. J. P. Kanoky and R. L. Sutton. *Journal A. M. A.*, Dec. 19, 1908, p. 2157.

Case of Raynaud's Disease. A. A. Lustig. Abstracted in *Journal A. M. A.*, Jan. 2, 1909, p. 84.

Spasmodic Torticollis Cured by Operation. Fred T. Murphy. Reported in *Boston Med. and Surg. Jour.*, Dec. 24, 1908, p. 865.

Behandlung der Neuralgien und Neuritiden durch die physikalischen Heilmethoden. Abstracted in *Zentralbl. f. chir. u. mech. Orth.*, Dec., 1908, p. 549.

Rational Helps in the Treatment and the Care of Cripples. By Rosenfeld. *Zeit. für orth. Chir.*, XXII Band, 1-3 Heft, 1908.

No abstract practical.—*Henry O. Feiss, Cleveland, O.*

Osteoplastic Filling of the Defect After Resection of the Lower Jaw with a Piece of Rib by Means of a Pedicle Flap from the Chest, or by a Free Transplantation. By Payr. *Zentralbl. f. Chir.*, 1909, XXV, 1965.

After considering, in brief, the methods heretofore used by himself and others to fill defects of the lower jaw following resection, the author gives two methods which he has employed with success. In both, he uses a piece of resected rib to fill the gap.

In the first, the operation is performed in two sittings. At the preliminary operation (preferably not under general anesthesia) a piece of rib and its entire periosteal covering is resected and placed in the infraclavicular region between skin and fascia (concavity of rib toward skin). In this transplanted position, it is allowed to remain three weeks, so that good circulation be established. At the second operation, and directly after the resection of the lower jaw, the piece of rib is brought to fill the gap by means of a pedunculated skin and fascial flap, the base of which is above the clavicle.

For the second simpler method, the author insists especially on absolute asepsis (mouth cavity). At the time of the resection of the lower jaw, a piece of rib (with its periosteum) is placed directly into the gap, held there with as little foreign material as possible, and the wound closed.

Three cases have been operated on by these methods; two by the first and one by the second. Case histories not given.

The communication is somewhat of a preliminary report to be followed by a more extensive report by Payr's assistant, Dr. Heller.

The Clinical Significance of Growing Pains in Children. By Dr. W. W. Butterworth. *New Orleans Medical and Surgical Journal*, November, 1908.

The author makes reference to the so-called "growing pains and growing fever," of the earlier writers.

In his review of the recent literature he finds no mention of growing fever and very little on growing pains.

The author makes seven groups of the pains that occur in infancy and childhood that were formally in the above classes.

These groups show that it is the differential diagnosis that is of importance.

One case of mild rheumatism is reported to show that the author believes that many of the cases are those of mild rheumatism.—*Edward S. Hatch, New Orleans.*

Remarks upon Excision of the Body of the Scapula. By R. I. Rowlands. *British Medical Journal*, March 28, 1908.

The three chief operations are: 1. Partial excision. 2. Excision of the whole scapula. 3. Interscapulothoracic amputation.

The most important points to discuss are: a. The immediate risks. b. The chances of recurrence. c. The loss of function. d. The amount of deformity associated with each operation.

In the past the main causes of death have been sepsis and hemorrhage, both of which have been more common after incomplete excision of the bone. There is no reason why this should be so if the scapular vessels are systematically ligated at the beginning of the operation.

The chances of recurrence: There is no recorded instance of the recurrence of enchondroma of the scapula after partial excision; therefore it is only necessary to remove as much of the bone as will insure the complete removal of the growth and the same is true of osteoma and of true myeloma. It is to be understood that it is not easy to distinguish between an enchondroma and a chondrifying sarcoma during an operation. As regards malignant growths whether it is necessary to remove the whole bone in all cases is open to question. Does the density of the scapula or the absence of diploe justify us in treating it a little differently from the long bones.

Loss of function: It is certain that the loss of use of the upper limb is far less after the operation adopted (incomplete excision) than after excision of the whole scapula. The preservation of the coracoid and the glenoid fossa is useful in many ways. The saving of the acromion process, if possible, is well.

The operator recommends a T-shaped incision. The horizontal limb of this should be placed high enough to tie the three main vessels at the beginning of the operation.

The ultimate success of the operation seems to depend largely upon the early adoption of systematic active and passive movements.

From the reviewer's standpoint excision of the body of the scapula should certainly be considered in certain cases, such, for instance, as innocent growths and for small and slow-growing malignant growths and perhaps in certain inflammatory conditions. The operation should not be more difficult or dangerous than is excision of the whole bone, and it certainly leaves a limb far more perfect from the functional and artistic point of view.—*A. Mackenzie Forbes.*

Practical Conclusions on the Statistics of Juvenile Cripples. By Biesalski (Rosenfeld). Abstracted in *Centralblatt für chir. und mech. Orth.* 1908, p. 543.

Report (read before the 80th meeting Deutscher Naturforscher und Aerzte, Koeln, Sept., 1908) concerning the best way to improve the connection between cripples-hospitals and the state. Forms were filled out and sent to the government in order to use them in looking out for cripples who need home care. Biesalski's definition of the word cripple, stated on the orthopedic congress, Berlin, 1908, is recommended to be generally acknowledged. There are to be considered not only the real crippling diseases, but also

social conditions and other faults, like blindness, feeble-mindedness. In Germany, except Bavaria, Baden, and Hessen, of 75,183 cripples 42,249 need home care in the physician's opinion, while only 3,000 beds are at hand. A satisfactory care for cripples would save fifty million marks annually for the charity institutions in Germany. To complete this work, which is very important in a purely humanitarian and social sense, it is necessary that interest be taken by all people.—*H. Bucholz, Boston.*

Actinomycosis of the Ribs and Vertebrae. By Dr. James K. Young, Philadelphia, Pa.

Dr. Young reports a case of actinomycosis of the vertebrae in a healthy man living in good hygienic conditions. First symptom noted was difficulty of deglutition which disappeared after treatment. Soon after the patient developed an extensive area of infection, including left side of neck and left scapula region. On admission to the U. of P. Hospital in May, 1907, patient was anemic and emaciated. Lungs and pharynx were normal. "Spine had normal movements" in spite of "a bony kyphosis." Skiagraph showed lesions of the second and third ribs at angle and normal vertebrae. Prior to the determination of the specific character of the infection, after orientation on cadavers, extensive extirpation of the infected area was accomplished through a special incision and better drainage established. No definite bone lesions were reported at operation. "Scrapings from the second and third ribs" yielded "the ray fungus." Staphylo- and streptococci were found in the pus, but no tubercle bacilli. Strepto- and staphylococcus sera were ineffectual. The therapeutic effect of potassium iodid could not be obtained during treatment. Later the disease extended to neighboring parts, producing nodules containing the characteristic yellow sulphur bodies. "The disease could not be controlled by K. I. and in seven months from operation the patient died of pyemia."

At necropsy it was found that many abscesses were present in the "muscular and intermuscular tissue beneath the periosteum" in the infected area; that the tenth dorsal vertebra was denuded of periosteum and had an afferent sinus; that the ribs, referred to above, scrapings from which furnished data for diagnosis, were "whole and unaffected by disease." Portions of the spinous processes, on examination exhibited "well-defined bodies" which were "believed to be the ray fungus."

The skiagraph showed normal vertebrae of the spine which had normal movements; the second and third ribs referred to above were "unaffected by disease"; and no definite bone lesions were noted at operation; therefore it is evident that the infection was confined primarily to the soft parts, with ultimately a limited destruction of one vertebra, discovered at autopsy.—*W. J. Merrill, M. D., Philadelphia, Pa.*

Some Deformities of the Hand. By Eliot Alden, M. D. Los Angeles, Cal. *Annals of Surgery*, December, 1908.

Report of two cases with photographs and x-ray plates.

CASE I.—Web fingers and phalangeal deformities. Patient was a carpenter and able to work. No treatment.

CASE II.—Loss of proximal phalanx of the index-finger. Patient seventy years old, had been injured years ago. Bone of finger had protruded and was snipped off. Finger was shortened about one and one-half inches, but the flexors and extensors adapted themselves to the new conditions and a useful finger resulted.—*R. R. Fitch, Rochester, N. Y.*

The Question of Osteotomy. By Reichenbach. (A collective abstract of the literature of 1905-'06.) *Arch. f. Orthop., Mech. u. Unfallchir.*, Bd. VII, H. 1, p. 93.

V. Alberle recommends the circumferential osteotomy of Reiner which is based upon Billrath's practice of "chiseling the cortex." With an especially constructed chisel about one-third or one-half of the cortex is divided on the concave side of the deformity without injury to the spongiosa. The bone is now broken through by manual force. In adduction contractions of the hip, the operation must of necessity be performed on the convex side and the bone fractured by increasing the deformity.

Osteotomy is not to be performed in Paget's disease on account of the resulting lack of callus and nonunion.

Witteck has given up epiphyseolysis as well as the usual osteotomies for genu valgum and has devised certain peculiar curved forms of osteotomy which he praised very highly, but which proved to be of more theoretic than practical importance. He now confines his practice to an oblique osteotomy which runs downward and outward from the inner side of the femur. If the seat of the deformity be in the tibia this is chiseled through.

Pätzold reports from the clinic at Renigsberg that the tibia being the usual seat of the deformity in genu varum on account of the early ossification of the femur epiphysis, is usually divided by a wedge-shaped osteotomy, the wedge removed is broader posteriorly than anteriorly. If the deformity be great the tibia and femur are both to be divided but at different sittings.

Härtung praises Hoffa's subtrochanteric osteotomy for coxa vara.

Madelung's deformity is corrected by Poulsen by an osteotomy of the radius. This gives excellent results in moderately severe cases but in the severest types nothing permanent can be accomplished on account of the tension of the flexors.

Simple osteotomy is preferred by all writers for the correction of deformities following the arthritis.

Hohman has described a lever to be inserted between the bone and the soft parts to protect the latter and to firmly fix the bone.

Deutschlander reports operating upon a cured case of osteomalacia to decrease the deformity. To assist the callus formation he began to use of Bier's hyperemia one week after the operation. The results were brilliant here as well as in fourteen subsequent cases of simple osteotomy.

Vigorous attempts have been made especially in Vienna to correct the deformity from badly united fractures. Oblique or Z-shaped osteotomies are performed followed by extension apparatus, casts or Codivilla's extension methods with the nailing of the fragments. Osteoclasia seems to be useless in these cases.

Three cases of micrognathia were successfully treated by V. Auffenberg by sawing through the symphysis mentæ with a Gigli saw.

For the malposition, pain, and bad function of malum coxæ senilis, Lorenz advised subtrochanteric osteotomy with correction of the deformity.

The wedge-shaped osteotomy for the correction of club-foot seems to have deservedly lost its popularity.—*Walter G. Stern, Cleveland.*

The Present Status of Serum and Vaccine Therapy. By Mark Wyman Richardson. *Am. Jour. of the Med. Sciences*, October, 1908, p. 511.

Dr. Richardson reviews the work which has been done in serum and vaccine therapy and reports the results of its use in the following conditions by different observers:

Actinomycosis.—One case treated with a vaccine. Good result.

Anthrax.—Sixty-five cases and two deaths under treatment with a specific serum.

Cancer.—No serum has yet been found which has a specific action.

Cerebrospinal Meningitis.—Reports brilliant results by the use of the serum produced by Flexner and his associates, especially when administered in the first twenty-four hours

Cholera.—Effective antisera have not yet been developed, but the incidence of the disease among the inoculated is one-tenth that of the uninoculated.

Infections Due to the Colon Bacillus.—Vaccine treatment of ten shows striking improvement in subjective symptoms.

Diphtheria.—Diphtheria antitoxin continues to be the first and foremost antisera both for treatment and prophylaxis.

Bacillary Dysentery.—Inoculation with the serum does not prevent the incidence of the disease, but reduces the mortality from 20 to 30 per cent. to practically nothing.

Erysipelas.—Streptococcus vaccines tend to shorten the course, but have no effect on recurrence or immigration.

Exophthalmic Goiter.—Specific antithyroid therapy has been followed by beneficial results in a large number of cases.

Gonorrhea.—Specific treatment by sera hopeful. Acute joints do not clear up as well as under vaccine treatment as chronic ones, but treatment as a whole has not been very successful.

Hay Fever.—Beneficial results from use of pollatin doubtful.

Leprosy.—Reports show in some cases a cure and in others improvement, not yet, however, on a sound basis.

Leukemia.—Use of the Coley serum is of probably no value.

Plague.—Inoculation apparently reduces changes of contagion and also lower mortality in those inoculated. Early use of the vaccines may be of service in abating the disease.

Pneumonia.—Consensus of opinion is against the value of antipneumococcic serum.

Sarcoma.—Coley has reported good and permanent results from the use of the toxins of streptococcus and bacillus prodigiosus.

Staphylococcus Infection.—The results of specific vaccines used in these infections have been more encouraging than in any other bacterial invasion.

Streptococcus Infections.—Early treatment essential, but usefulness still in question.

Snake Venoms.—Antivenoms are highly if not absolutely specific.

Tetanus.—Antitetanic serum highly prophylactic, should be given early, and the greater the delay the greater the dose.

Tuberculosis.—Sera of Marmorek and Maraglian, of doubtful value. There exists a favorable opinion for active immunization produced by direct inoculation. Best serum to use is that produced by a combination of the living filtrate (Tuberculin B. F. of Deny) with bacillary emulsion (Tuberculin B. E. of Koch).

Typhoid Fever.—Following inoculation mortality was reduced from 11.9 per cent. to 4 per cent. In the inoculated the disease is milder and there are fewer complications.

The value of the opsonic index as a guide to the use of vaccines is unreliable.

This is an interesting review of the work done and results obtained to date and is well worth reading.—James Warren Sever, Boston.

Raynaud's Disease, Erythromelalgia, and the Allied Conditions in their Relation to Vascular Disease of the Extremities. By B. Sach, M. D. *Am. J. Med. Sc.*, October, 1908.

In a brief paper, in which he reports six cases, Dr. Sach states his belief that the diseases Erythromelalgia and Raynaud's disease are not morbid entities, but are the expression of disease of the peripheral blood-vessels. He admits that occasionally they are associated with disease of the central nervous system and that the patients occasionally may have had syphilis, but he believes that there is no connection between them. He summarizes as follows the points that the six cases bring out.

1. Erythromelalgia and Raynaud's disease are often associated with one another; a sharp line of demarcation between the two cannot always be maintained, and the types blend into one another so readily that the exact labeling of a case is often a matter of great difficulty.

2. The clinical symptoms at one part of the disease correspond closely to the erythromelalgic type, and at a later stage to the Raynaud type.

3. Erythromelalgia is relatively frequently associated with gangrene.

4. There are cases which in their incipency present typical symptoms of Raynaud's disease, and as they progress might very well be designated cases of spontaneous gangrene due to obliterating endarteritis.—*J. W. Sever, Boston.*

Thromboangitis Obliterans: A Study of the Vascular Lesions Leading to Presenile Spontaneous Gangrene. By Leo Buerger, M. D. *Am. J. Med. Sc.*, October, 1908.

In this most interesting and instructive paper Dr. Buerger describes the condition commonly known as obliterating endarteritis, gives a brief history of the studies on this disease and explains why in his mind the name is not adequate and presents new theories to bear out his statement.

The original name was applied after the work of Von Winewarter and Friedländer who held that the closure of the vessels was due to proliferation of the element of the intima. Then came Weiss and Zoege Mantenffel who thought the process was due to a primary arteriosclerosis with the formation of parietal while thrombi starting in the larger vessels of the extremity and extending downward. Dr. Buerger's investigations go to show that the process is due to the formation of red thrombi usually starting in the smaller vessels and extending to the larger ones. "Most of the larger arteries and veins of the amputated limbs were found obliterated over a large extent of their course." The most recent thrombi were found in the larger vessels and above the recent thrombi in many cases the lumen and walls were normal. "The obliterative process at any stage can be examined if enough vessels are examined. The occlusion of the vessels is effected by red obturating thrombi, these become organized, vascularized and canalized. The recent red thrombosis may involve large portions of arteries or veins and is not secondary to the gangrenous process. It occurs even when no gangrene is present. Certain changes in the perivascular tissue, in the adventitia, media, and intima regularly accompany the occluding process. There is moderate thickening of the intima; this is never sufficient to cause marked narrowing of the lumina of the vessels and does not seem to play any considerable rôle in the genesis of thrombotic process."

In none of the cases examined was there a history of syphilis, although Dr. Buerger says that the periarteritis present is suggestive of syphilis.

Dr. Buerger suggests that the names endarteritis obliterans and arteriosclerotic gangrene be discarded and the term obliterating thromboangitis be adopted.—*J. W. Sever, Boston.*

Echinococcus of the Muscles. By G. A. Baradulin. *Wiener klin. Wochenschrift*, Vol. XXI, 1908, No. 35, p. 1238.

The author gives his observations on echinococcus of the muscles, with a report of three of his personal cases, one with the lesion in the deep muscles of the back, one in the thigh and one in the shoulder muscles.

In the 246 cases collected (including these), the regions affected were as follows: Head 12; neck, 35; back, 86; upper arm, 26; lower arm, 2; gluteal region, 14; ileopsoas region, 6; thigh, 60; leg, 4.

Muscle echinococcus is comparatively rare, about 1.9 per cent. of all cases, which may be explained by the long route which must be followed by the parasites in order to reach the muscles from the alimentary canal. Few are able to pass through the liver, heart, and lungs before becoming fixed.

The larger and more active muscles with their comparatively copious blood-supply are those most affected.

Trauma is the only sure factor in the etiology. According to observations, most cases occur in patients between the ages of 20 and 30 years, and the greater proportion in women.

The cyst may take from one to sixteen years to develop. The first sign noticed by the patient is usually a swelling, for the preceding manifestations are usually vague and variable. The pain felt usually disappears on rest, reappearing on motion. The growth of the cyst is regular—at times it seems to grow smaller. It is usually very tense as fluid collects rapidly in it and fluctuation, especially in deep-seated tumors is difficult to detect.

Diagnosis is attended by some difficulty. The swelling may be mistaken for a cold abscess, and must be differentiated from muscle hernia and muscle rupture. Treatment may be puncture, incision, and excision, of which the last is usually to be preferred.—*Emma Lootz Erving, Washington.*

Opsonins and Their Diagnostic Importance. By M. Arinkin and C. Schneider. *Berl. klin. Wochenschrift*, 1908, Vol., XLV, No. 5.

After a description of technic and definition of opsonins and opsonic index, the authors give a table of twelve curves, showing opsonic indices in ten tuberculous and two staphylococcus infections. In the tuberculosis cases the curve shows marked deviation from the normal, even in localized infections. In these last the index is on the whole low, and rises after application of peru balsam and after motion. After operation the index falls if drainage is good, though a rise is observed when numerous lymphatics are opened during the operation, and there is no adequate drainage of the secretion. After rest the index usually falls below normal. In severe cases irregular variations occur. In localized infections the curve usually falls with rest, in general infections the curve is wholly irregular.

In the localized staphylococcus cases the deviations of the curve are less marked and more regular than in tuberculosis. In the early stages of infection the index is above normal, owing to autoinfection. Operation or massage causes a rise of the curve, escape of pus a fall, formation of a new furuncle a new rise. After recovery the index is slightly above normal. The curve shows whether the seat of infection is walled off or not and, if it does not deviate much from the normal, justifies a good prognosis. A fall below normal indicates a center of infection which is using up opsonins, as, for example, a walled-off abscess.

The authors found no parallel between the opsonic curve and the pulse and temperature. They consider the opsonic index a valuable aid to diagnosis in infections.—*Emma Lootz Erving, Washington.*

Periarthritis Scapulohumeralis. By A. Schlesinger, *Berl. klin. Wochenschrift*, 1908, Vol. XLV, No. 5, p. 249.

The author gives Duplay's definition of what he calls periarthritis scapulohumeralis, viz.: A painful stiffness of the shoulder due to trauma, which causes inflammation of the synovial membranes in the region of the shoulder-joint, especially of the subacromial or subdeltoid bursa.

There follow descriptions of three cases by different observers and one by the author himself, all differing markedly in symptoms, and he asks if by investigating these cases it is evident that they betoken an affection having as its cause a condition of the subdeltoid bursa, or if the symptoms may not all be due to any contusion or replaced dislocation of the shoulder-joint.

Duplay, in a postmortem examination, found a disappearance of the subdeltoid bursa. The author denies the possibility of such a result of the inflammation of the bursa, and explains the disappearance of the bursa by atrophy from disuse.

Taking up in order the symptoms attributed by various writers to periarthritis scapulohumeralis, he claims that they may all result from articular injury, as well as from periarticular disease. He divides shoulder ankyloses of traumatic origin into

1. Those of articular origin.
2. Those of paraarticular origin (sic).
3. Those in which combined joint and paraarticular tissue are involved.—

Emma Lootz Erving, Washington.

Articular Hemophilia. By P. Cruet, *Presse Médicale*, 1908, No. 73.

Deals mainly with classifications of the various joint manifestations, and contributes nothing new to the present knowledge on the subject.

"Trigger-Hip" or Perrin-Ferraton's Affection. By R. Horand; *Gaz. des Hôp.*, 1908, No. 110.

Chief characteristic is the occurrence, during walking, of a distinct click at the hip, audible at a distance. There is no actual lesion, nor any anatomical abnormality. Seven authentic cases are on record. The snapping sound occurs at the instant that the great trochanter passes beneath the anterior fibers of the gluteus maximus. This explanation has been confirmed twice by exploratory operation. When the muscle is fatigued by repeated voluntary contraction the phenomenon cannot be elicited. An acquired condition, chiefly in well-muscled, but slender individuals; overexertion and traumatism, especially, are causal factors. The snapping is most often produced by forced adduction and external rotation, and is sometimes accompanied by a painful sensation. Having learned the trick, a simulator may produce the click at will. In *bona fide* cases surgical measures are generally required before it can be made to disappear. The operation of Bayer gave excellent results. He freed the anterior border of the gluteus maximus, divided the tendon and inferior part of the muscle, raised the margins of this incision and sutured them in front of and behind the trochanter, partly to periosteum, partly to aponeurosis of vastus externus. Complete bibliography is appended. (See also "Notes on the So-called Snapping Hip;" Pupovac, *Wien. kl. Woch.*, 1908, No. 19. Abstracted in this JOURNAL for Nov., 1908, p. 337).—*Roades Fayerweather, Baltimore.*

The Early Treatment of Thoracic Deformity. By Mme. Nageotte-Wilbouchewitch. *Archiv. de Méd. d. Enfants*, 1908, No. 7.

Author emphasizes importance of instituting treatment at the earliest possible moment in these cases, especially in those due to infantile paralysis or rickets. Citation of cases, with photographs.

Shortening of Humerus Due to Resection of the Head in Infancy. By Broca. *Gaz. des Hôp.*, No. 118, 1908.

Report of a case in point. Broca speculates on the probable nature of the lesion that was so treated, and sounds a warning against removal of the ununited upper epiphysis, except in very urgent cases.

The Practical Importance of the Anatomical and Habitual-functional Noncoaptation of Joint Surfaces. By G. Preiser, Hamburg. *Fortschritte der Roentgenstrahlen*, Band XII, p. 313.

The anatomist makes a distinction between congruent and incongruent joints, e.g., the hip is a congruent and the knee an incongruent joint. The sense of the word congruence used in this paper is different from that. P. will express by the word incongruence a condition of noncoaptation of the joint surfaces in the physiological way, so that a part of the surface covered with cartilage is no more in articulation. In studying carefully the X-ray pictures of knees, hips, elbows and shoulders, affected with arthritis deformans, he found in all such cases a noncoaptation of these joints, and in that he believes may be seen the origin or even the cause of the deforming processes. That part of the joint surface which is no more used for articulation loses its cartilage and will later show other alterations characteristic of the mono-articular form of arthritis deformans which must not be classed with the multiple form.

P. found this noncoaptation:

1. *In the Hip.*—In cases of old tubercular arthritis, after fractures of the neck of the femur healed with deformity, and also in static deformities. The cause of the *malum coxæ senilis* is usually due to such static noncoaptation, by which a part of the head of the femur loses its proper use.

2. *In the Knee.*—Any disturbance of the static unity of the leg may produce a prominence of the border of the lateral condyle of the tibia over the femur seen in the X-ray picture. P. found this prominence in all cases of arthritis deformans of the knee.

3. *In the Elbow.*—The X-ray picture showed also here in all cases of arthritis deformans a prominence of the head of the radius.

4. *In the Shoulder.*—Under certain pathological conditions, which may be produced by trauma, infectious processes or static alterations, a part of the cartilaginous surface will not any more be used for articulation and will then be changed in the way stated above.

P. gives these ideas with all reservation and ask to have others prove them in the hope that the etiology of the arthritis deformans may be cleared by his observations. We know the important influence of static alterations on the joints and use this fact in order to cure affections of joints which we see when static alterations are present. But the decision about the question set by P. will need further observations at especially operations and autopsies to study many different stages of arthritis deformans.—H. Bucholz. Boston.

The Condition of Parts Sixty-two Years after Excision of the Elbow.

By H. A. Moffat. *Edinburgh Medical Journal*, September, 1908.

The patient is seventy-eight years old and leads an active life, getting good use of the arm, the elbow of which was excised when he was sixteen years old. The joint is partly flail, but still very useful; active extension and flexion, pronation and supination all present to full range. There is both active and passive overextension of about ten degrees and there is some degree of passive lateral mobility. The muscular development of the arm is poor, both biceps and triceps being small and soft; that of the forearm is very good.

With the arm hanging he can carry weights as well with one hand as the other. He can use a hammer and plane well. The power of his hand, e.g., in writing is not in the least interfered with.—A. Mackenzie Forbes.

Transplantation of Bone and Parts of Joints. By Muller. *Münch. med. Woch.*, 1908, No. 29.

This is a very short description of two cases.

1. Bilateral club-hand from absence of radius. Transplanted a piece of tibia with periosteum and joint cartilage attached.

Result.—Correction of club-hand.

2. Congenital defect of lower third of ulna with consequent lengthening of radius. A piece from upper part of radius, also with periosteum and joint cartilage, was transplanted.

Result.—Not stated. Primary union and growth in thickness and length in both cases.

Arthrogenous Muscle Atrophy. By Rostoski. *Münch. med. Woch.*, 1908, No. 27.

Report of Cases.

1. Man, age fifty-three, has had repeated attacks of acute articular rheumatism; fourteen days before entering hospital had fresh attack in right knee and both shoulder-joints, followed in shoulder by great atrophy of infraspinatus and posterior part of deltoid.

2. Man, age fifty-nine, after rather prolonged and indefinite affection of the right shoulder-joint following an injury; patient showed marked atrophy of supra- and infraspinatus with normal electric reactions.

In these cases radiographs show no bone atrophy. Author considers it impossible that these atrophies follow simply disuse; he thinks it possible that some irritation of the spinal cord is caused by the diseased joint capsule and that this in turn affects the trophic center for the muscles.

The Healing of Wounds in the Joint Cartilages. By Cramer. *Zeit. für orth. Chir.*, XXII Band, 1-3 Heft, 1908.

This paper is of extreme value. Author operated on young rabbits at the age of two to five months. The knee-joint was opened and the lesion made in the cartilage either in the form of a simple cut or by removal of small pieces of cartilage sometimes with bone attached. The operations were done with the greatest aseptic precautions. The animals were killed on the third, fifth, sixth, seventh, tenth, seventeenth, fifty-first, seventy-fourth, ninety-sixth, and ninety-eighth days. Twenty animals were used, two dying under narcosis. After killing the animals, the joints were removed and prepared for histological examinations. The results of his researches bear out early observations of Kolliker, Rokitsky, Thiersch, and Gurlt.

In a summary he states that if the cartilage alone is injured then fibrin with isolated nuclei is deposited in the first few days. These nuclei may come from the capsule or from the blood. The cartilage cells at the wound do not change except by becoming more nucleated and changing their position in rows as though they were taking a start and were tending to change; but they remain in that state. He never saw any karyokinesis nor any signs of proliferation and therefore no cartilage callus. There was also no gumming together of cartilage to be discovered. The cartilage wounds presented after two or three months the same findings as on the third day after the injury.

Altogether different were the pictures in preparations of wounds in which the bone was also injured. In these there is also to be noticed in the first few days a deposit of fibrin. Six or ten days later this disappears and there comes from the incised bone marrow connective tissue growing into the cartilage wound. This is vascular. The marrow spaces in the region of the lesion contain more cells and fibrilli than normal at the expense of fat cells, connective tissue keeps growing and spreads, becoming firmer and deeper. After three months, it is only confined to the excised marrow space and bone plates appear in other places. He never saw a tendency of the connective tissue, whether it stems from bone, cartilage, or the synovial, to metaplasia into fibro- or hyalin-cartilage. The cartilage cells of the incision remain absolutely passive. He never saw karyokinesis, which is contradictory to Seggel, who saw new cartilage formed together with new ground substance. The illustrations of this article are excellent.—*Henry O. Feiss, Cleveland, O.*

The Treatment of Deformities of the Lower Extremities. By Schultze.
Zeit. für orth. Chir., XXII Band, 1-3 Heft, 1908.

This paper is somewhat along the line of previous papers by the same author and there are described elaborations of the corrective apparatus described in previous articles with a number of case reports.

In a summary he states that the bloodless methods, osteoclasis and redressment are first in order. The machine should be combined with manual treatment. The treatment of club-foot by means of this osteoclast signifies a new achievement, which gains its value in that manual redressment reaches to a higher efficiency on account of the power of the machine. The flat-foot osteoclast described is just as effective. Every club-foot as well as every flat-foot is to be reconstructed. The bloodless method is the one to be selected. The open method destroys the anatomical structure without building a new one. The indication for the open method in varus and valgus is completely removed on account of the improvement in modern technic, and according to his idea the open method represents simply a shortcoming in skill.—*Henry O. Feiss, Cleveland, O.*

The Present State and Distribution of Care of Cripples in Germany.
By Biesalski. *Zeit. für orth. Chir.*, XXII Band, 1-3 Heft, 1908.

This paper is of interest especially from a sociological point of view and scarcely admits of abstracting. His definition of an institutional cripple is an invalid who following a congenital or acquired nerve, bone, or joint lesion interfering with the use of his trunk or his limbs, and in whom the relation between the severity of his disturbance and his life surroundings is so unfavorable that his residual spiritual and bodily force can only be developed to the highest possible point of economical self-reliance in an institution which provides peculiarly for such a cripple a necessary abundance of

medical and pedagogic influences at the same time. Statistics are given showing the distribution of the important cripples of Germany.—*Henry O. Feiss, Cleveland, O.*

A Peculiar Bone and Joint Process. By Aberle. *Zeit. für orth. Chir.* XXII Band, 1-3 Heft, 1908.

Author describes two cases somewhat resembling each other except in the localization of the manifestations. This is an affection which apparently comes on spontaneously, and attacks bones more or less distant from one another. It leads to extreme destruction and even to complete disappearance of bone. The beginning of the disease is insidious and the affection is not symmetrical. It tends specially to the joint ends of the bones. In no case can we ascribe an inciting cause such as trauma or infection. There is no sign of lues, neither is there any sign of nerve disease or cord lesion. One author describes the cause as a trophoneurotic disturbance. If this is so it must be peripheral.—*Henry O. Feiss, Cleveland, O.*

Care of Cripples in Austria-Hungary. By Aberle. *Zeit. für orth. Chir.*, XXII Band, 1-3 Heft, 1908.—*Henry O. Feiss, Cleveland, O.*

Care of Cripples in the United States. By Lovett. *Zeit. für orth. Chir.*, XXII Band, 1-3 Heft, 1908.—*Henry O. Feiss, Cleveland, O.*

The Tasks of Modern Orthopedics. By Baeyer. *Münch. med. Woch.*, September 8, 1908, LV, No. 36.

As stated in the title, the author discusses the scope of orthopedic surgery, citing views of certain men, including Lorenz and Vulpus. These views are now well known and require little mention. The author briefly runs over the history of orthopedics and states that according to this history the problems of orthopedics are those which have been neglected by the general surgeon. Orthopedic surgery should, therefore, advance along those lines and not attempt to enter the other fields.—*Henry O. Feiss, Cleveland, O.*

Asymmetry of Face and Skull in Relation to Torticollis. By Peters. *Münch. med. Woch.*, August 25, 1908, LV, No. 34.

A brief article discussing the relation of caput obstipum to asymmetry of the skull and face with two family case reports which tend to show that the asymmetry mentioned may take place congenitally without the caput obstipum. It may therefore be explained on the same grounds as Merkel explains left- and right-handedness, who attributes the individual peculiarity to a better organization in one or the other cerebral hemisphere.—*Henry O. Feiss, Cleveland, O.*

BOOK REVIEWS:

L'ORTHOPEDIE INDISPENSABLE AUX PRACTICIENS. By F. CALOT. Paris, Masson and Co. 1909. 825 original illustrations.

In a well-made book of some 750 pages Calot takes up the common orthopedic affections considering them in a way intelligible to the general practitioner as well as the specialist and dealing in detail with the question of treatment.

The first part of the book deals with acquired orthopedic affections of tuberculous origin, the second part with similar affections of nontuberculous character, the third with congenital orthopedic affections, and the fourth part, or appendix, with miscellaneous conditions. The most interesting

parts of the work are to be found in the sections dealing with tuberculosis of the spine, the hip, and the knee, and in the part devoted to congenital dislocation of the hip.

In the treatment of Pott's disease his admirable jacket technic is dealt with in detail. The pictures are really illustrative and much stress is laid on the careful modeling of the jacket over the pelvis. In tuberculosis of the hip and knee it is evident that his plaster work is of the highest grade, that the splints are most carefully modelled to the limb, and an inspection of the illustrations show plaster splints of the highest grade of efficiency. A good deal of space is devoted to the injection of tuberculous joints giving the most precise details for its use and the method is strongly advocated. The section on congenital dislocation of the hip presents a method of treatment somewhat modified from that used in this country and the mechanics of the treatment advised and the details of the application of plaster are most carefully given.

The part of the book dealing with scoliosis is unsatisfactory and suffers by comparison with recent German work. In the treatment of knock-knee both manual reduction by breaking off the epiphysis and osteotomy are described. The discussion of the treatment of club-foot, flat-foot, and infantile paralysis offers little that is new.

The book is throughout practical, definite, and clear and represents Calot's practice which differs in certain respects from the treatment in vogue here. It opens a point of view unfamiliar to most of us and is an extremely suggestive book. Any surgeon who uses plaster of Paris cannot fail to be helped by the admirable details given and the high standard of plaster work exemplified in the book. The work is a distinct contribution to orthopedic surgery and is worthy of careful consideration.

R. W. LOVETT.

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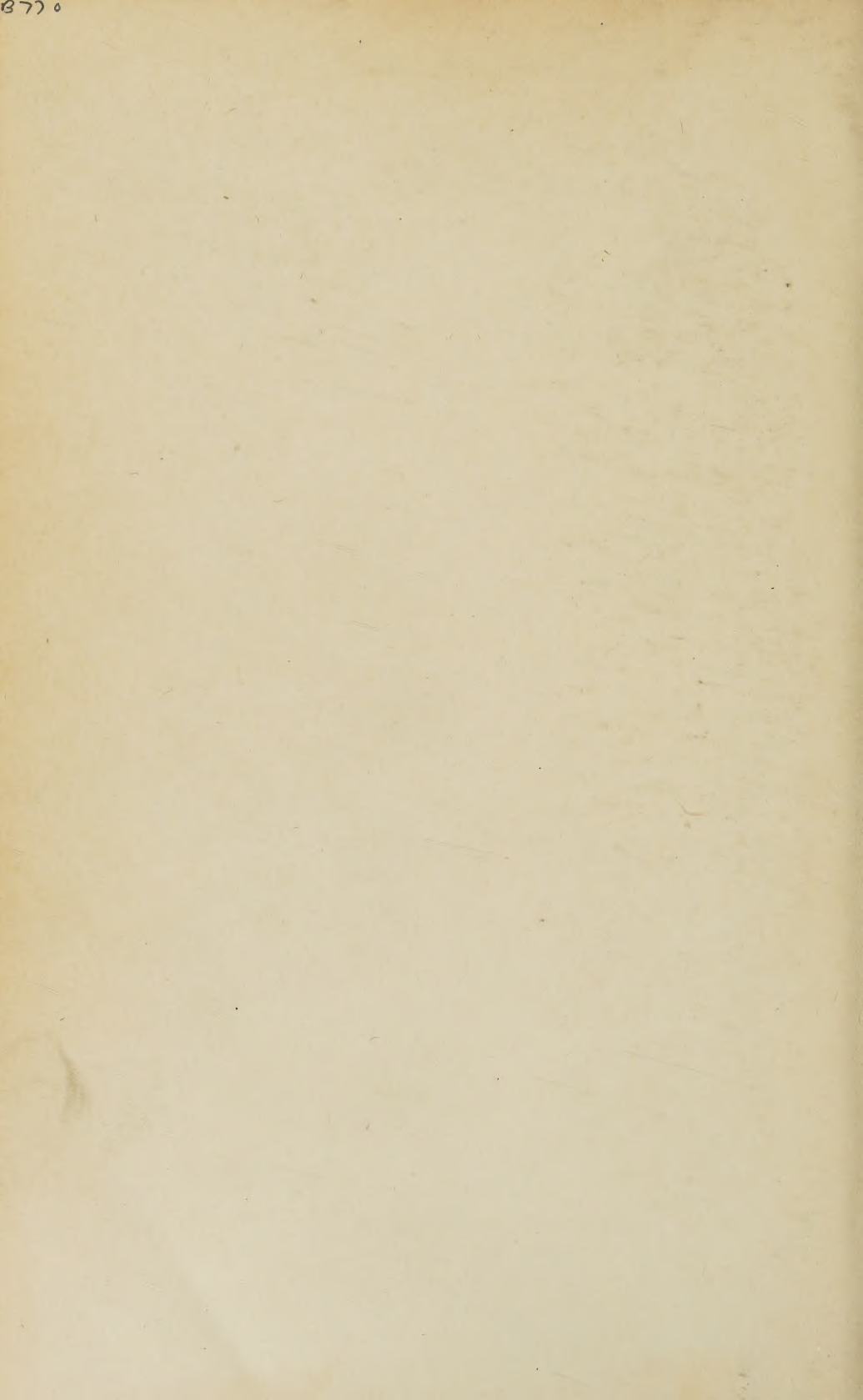
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